iM1716



Complementary Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Surface-mounted package
- ☑ Advanced trench cell design

1.2 Applications

- ☑ MB and NB
- ☑ Half – bridge Drivers
- ☑ Motor drivers

1.3 Quick reference

N-channel

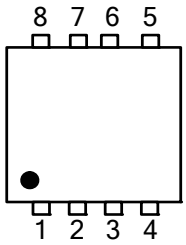
- ☑ BV ≧ 100 V
- ☑ P_{tot} ≦ 17 W
- ☑ I_D ≦ 7.2 A
- ☑ $R_{DS(ON)}$ ≦140 mΩ @ V_{GS} = 10 V
  $R_{DS(ON)}$ ≦155 mΩ @ V_{GS} = 4.5 V

P-channel

- ☑ BV ≧ - 100 V
- ☑ P_{tot} ≦ 17 W
- ☑ I_D ≦ - 6.7 A
- ☑ $R_{DS(ON)}$ ≦190 mΩ @ V_{GS} = - 10 V
  $R_{DS(ON)}$ ≦215 mΩ @ V_{GS} = - 4.5 V

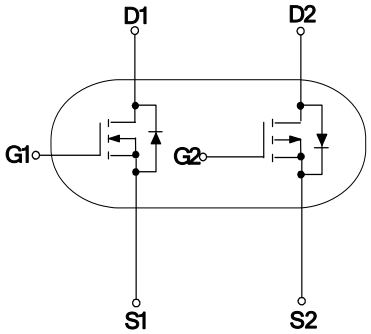
2. Pin Description

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



Top View

PDFN3.3x3.3-8L





3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
N-channel					
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	-	100	V
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	± 20	V
I_D*	Drain Current	T_C = 25 ℃, V_{GS} = 10 V	-	7.2	A
		T_C = 100 ℃, V_{GS} = 10 V	-	4.5	A
I_{DM}*,**	Pulsed Drain Current	T_C = 25 ℃, V_{GS} = 10 V	-	18	A
P-channel					
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	-	- 100	V
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	± 20	V
I_D*	Drain Current	T_C = 25 ℃, V_{GS} = - 10 V	-	- 6.7	A
		T_C = 100 ℃, V_{GS} = - 10 V	-	- 4.2	A
I_{DM}*,**	Pulsed Drain Current	T_C = 25 ℃, V_{GS} = - 10 V	-	- 18	A
P_{tot}	Total Power Dissipation	T_C = 25 ℃	-	17	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	85	℃ / W
$R_{\theta JC}$*	Thermal Resistance- Junction to Case		-	7.2	℃ / W

Notes：

* Surface Mounted on 1 in^2 pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

*** Limited by bonding wire

4. Marking Information

Product Name	Marking
iM1716	iM1716 XXXXX X : Date Code

5. Ordering Code

iM1716



6. 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_D = 250 µA	100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 µA	1	-	2.5	V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS} = 80 V, V_{GS} = 0 V	-	-	1	µA
I_{GSS}	Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	-	-	± 100	nA
$R_{DS(ON)}$[a]	Drain-Source On-State Resistance	V_{GS} = 10 V, I_D = 6 A	-	115	140	mΩ
		V_{GS} = 4.5 V, I_D = 4 A	-	120	155	
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = 6 A, V_{GS} = 0 V	-	-	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = 6 A, dI_{SD}/dt = 100 A/µs	-	19	-	nS
Q_{rr}	Reverse Recovery Charge		-	20	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 50 V Frequency = 1 MHz	-	1128	-	pF
C_{oss}	Output Capacitance		-	25	-	
C_{rss}	Reverse Transfer Capacitance		-	19	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 50 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 8.3 Ω, I_D = 6 A	-	6.1	-	nS
t_r	Turn-on Rise Time		-	3.4	-	
t_d(off)	Turn-off Delay Time		-	18	-	
t_f	Turn-off Fall Time		-	2.9	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{GS} = 10 V, V_{DS} = 50 V, I_{DS} = 6 A	-	20	-	nC
Q_{gs}	Gate-Source Charge		-	5.2	-	
Q_{gd}	Gate-Drain Charge		-	2.2	-	

Notes：

a : Pulse test ; pulse width ≤ 300 µs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing



6. 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_D = - 250 µA	- 100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = - 250 µA	- 1	-	- 2.5	V
I_{DSS}	Zero Gate Voltage Source Current	V_{DS} = - 80 V, V_{GS} = 0 V	-	-	- 1	µA
I_{GSS}	Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	-	-	± 100	nA
$R_{DS(ON)}$[a]	Drain-Source On-State Resistance	V_{GS} = - 10 V, I_D = - 3 A	-	155	190	mΩ
		V_{GS} = - 4.5 V, I_D = - 2 A	-	165	215	
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = - 3 A, V_{GS} = 0 V	-	-	- 1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = - 3 A, dI_{SD}/dt = 100 A/µs	-	23	-	nS
Q_{rr}	Reverse Recovery Charge		-	28	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = - 50 V Frequency = 1 MHz	-	1464	-	pF
C_{oss}	Output Capacitance		-	37	-	
C_{rss}	Reverse Transfer Capacitance		-	35	-	
t_d(on)	Turn-on Delay Time	V_{DS} = - 50 V, V_{GEN} = - 10 V, R_G = 3.9 Ω, R_L = 16.6 Ω, I_D = - 3 A	-	5.1	-	nS
t_r	Turn-on Rise Time		-	3.3	-	
t_d(off)	Turn-off Delay Time		-	113	-	
t_f	Turn-off Fall Time		-	33	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{GS} = - 10 V, V_{DS} = - 50 V, I_{DS} = - 3 A	-	27	-	nC
Q_{gs}	Gate-Source Charge		-	5.6	-	
Q_{gd}	Gate-Drain Charge		-	3.1	-	

Notes：

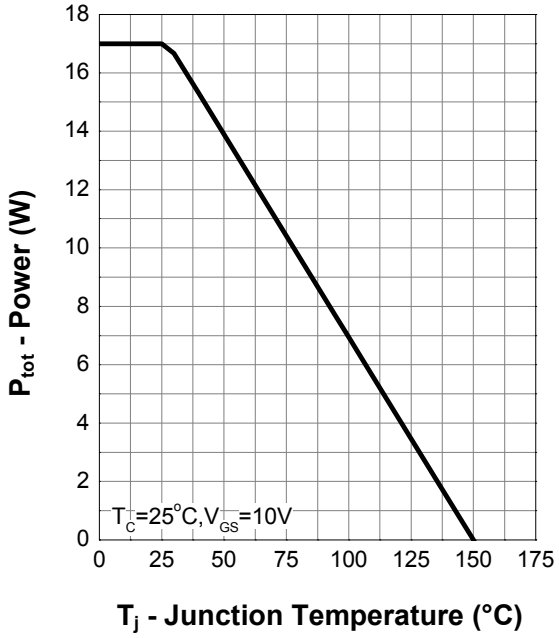
a : Pulse test ; pulse width ≤ 300 µs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

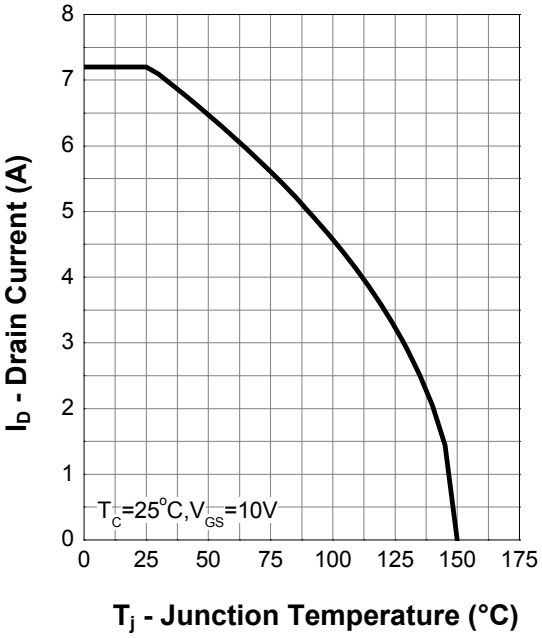
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N-channel:

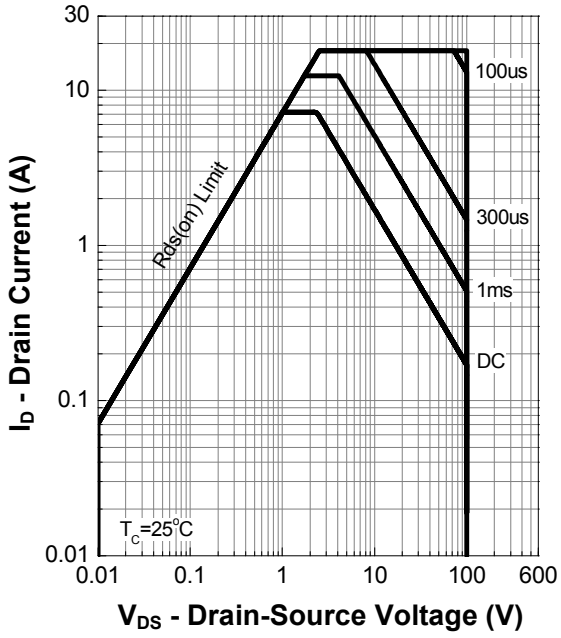
Power Capability



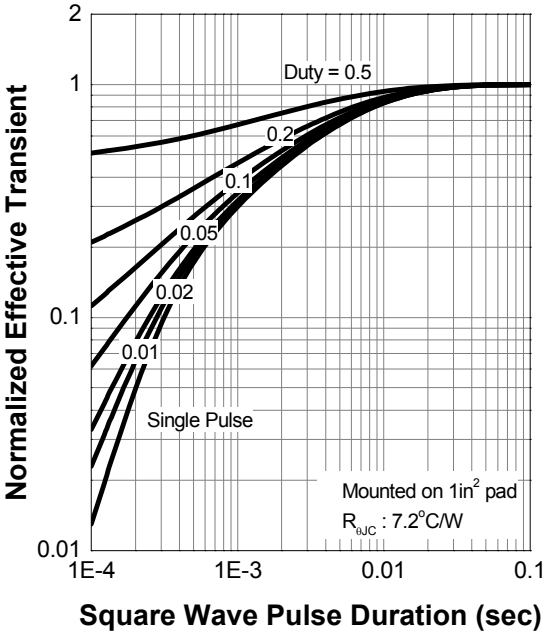
Current Capability



Safe Operation Area



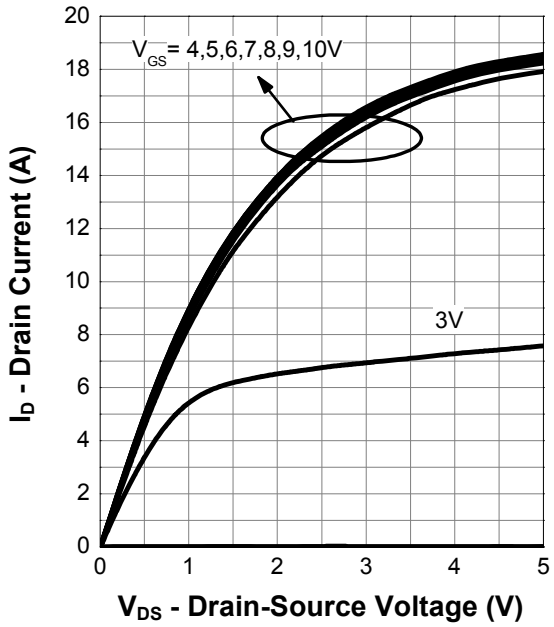
Transient Thermal Impedance



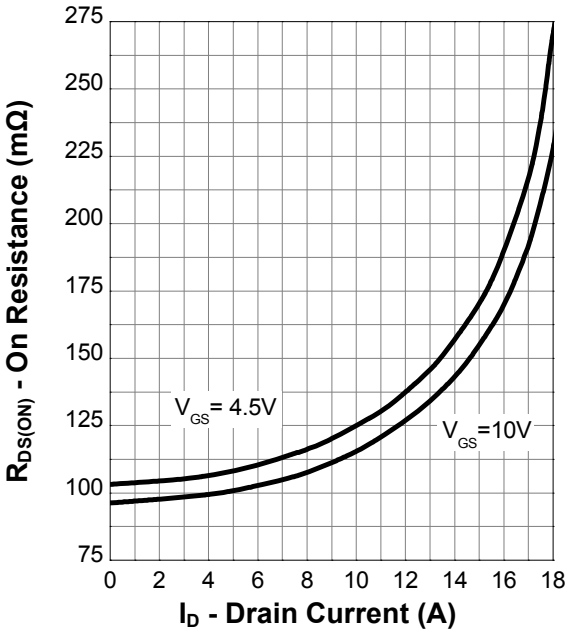
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N-channel:

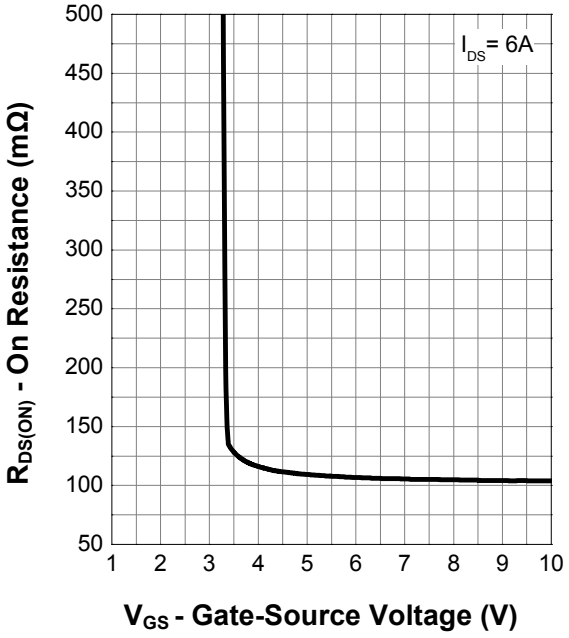
Output Characteristics



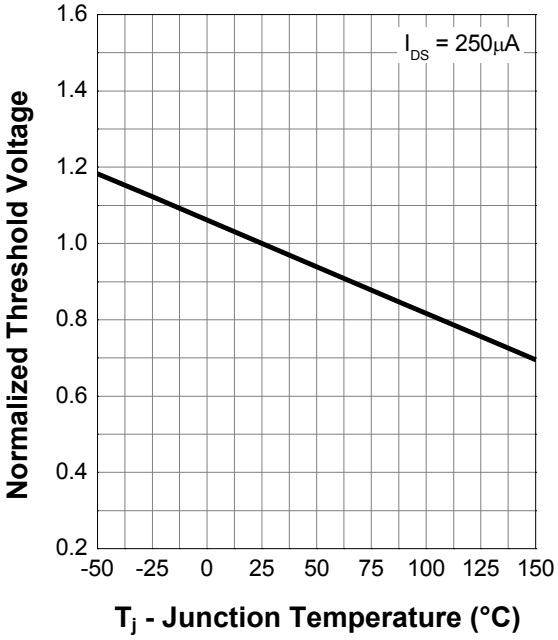
On Resistance



Transfer Characteristics



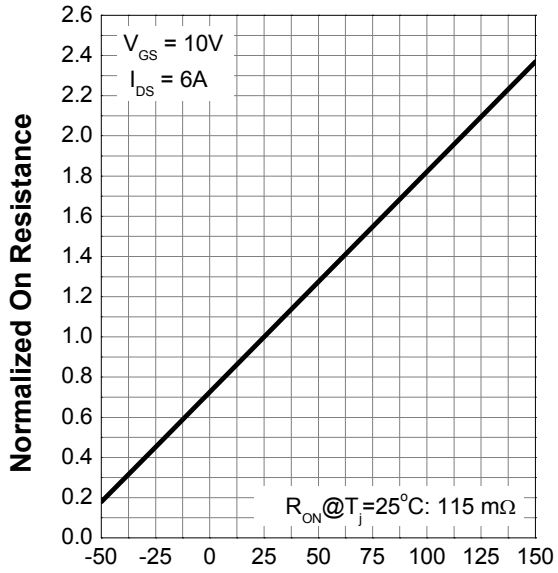
Normalized Threshold Voltage



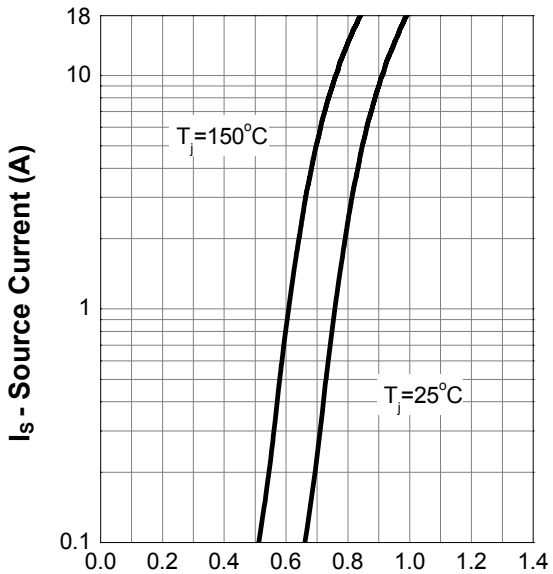
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N-channel:

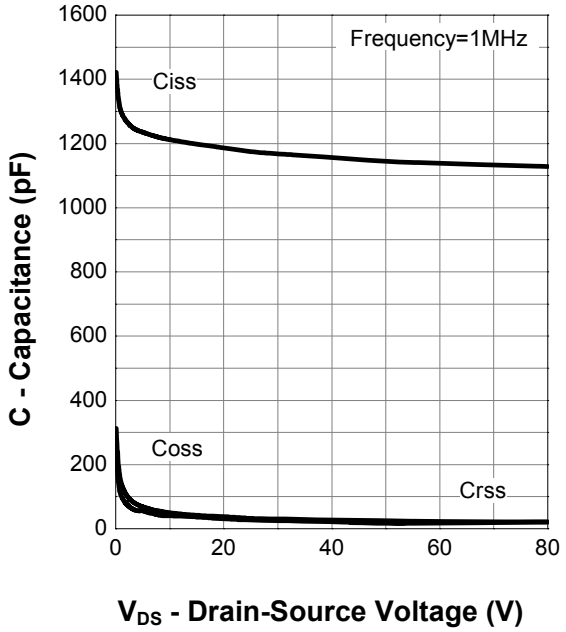
Normalized On Resistance



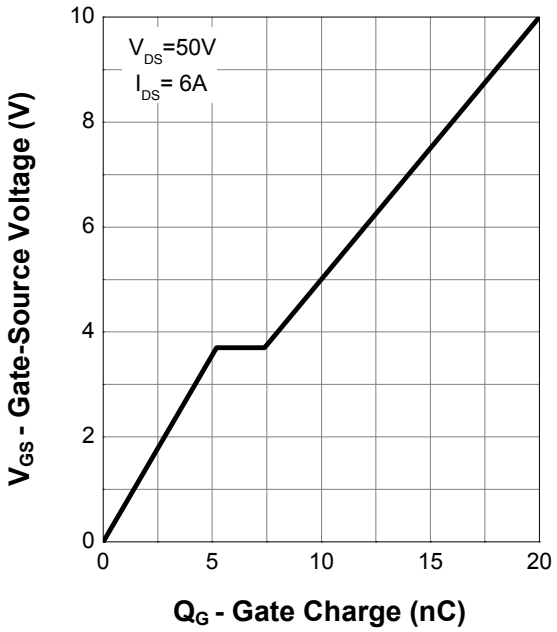
Diode Forward Current



Capacitance



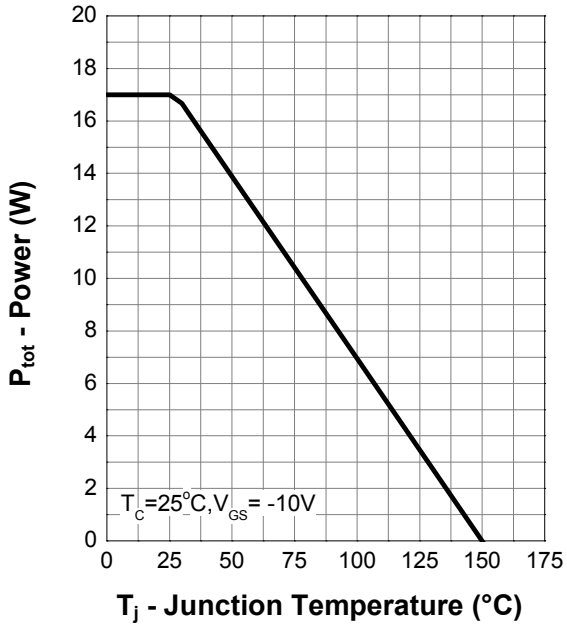
Gate Charge



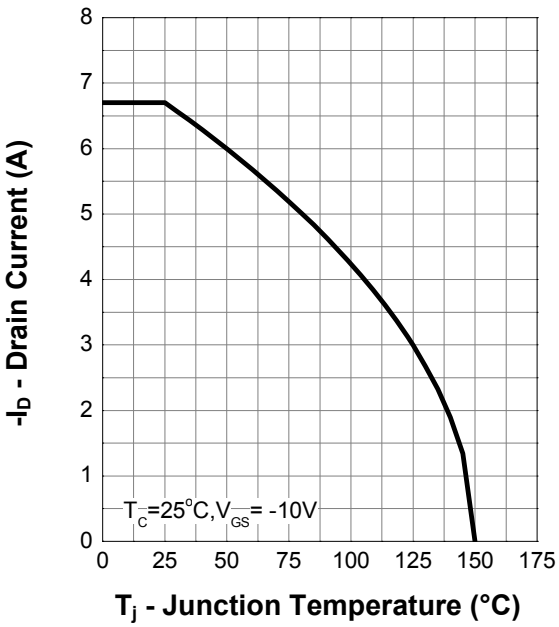
7. Typical Characteristics (Cont.)

P-channel:

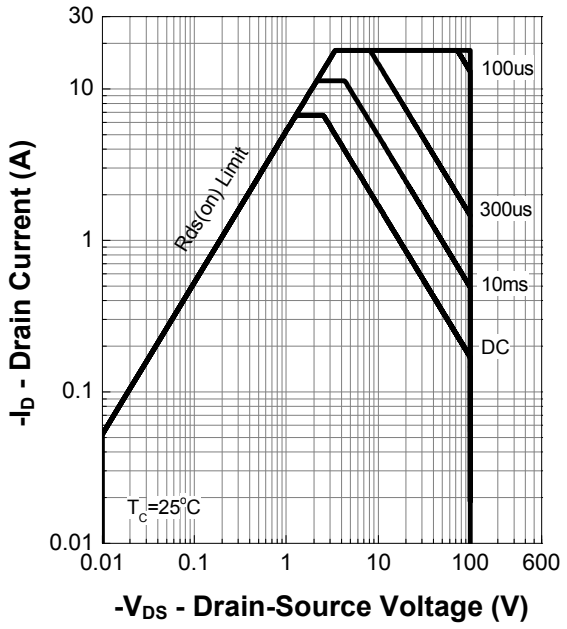
Power Capability



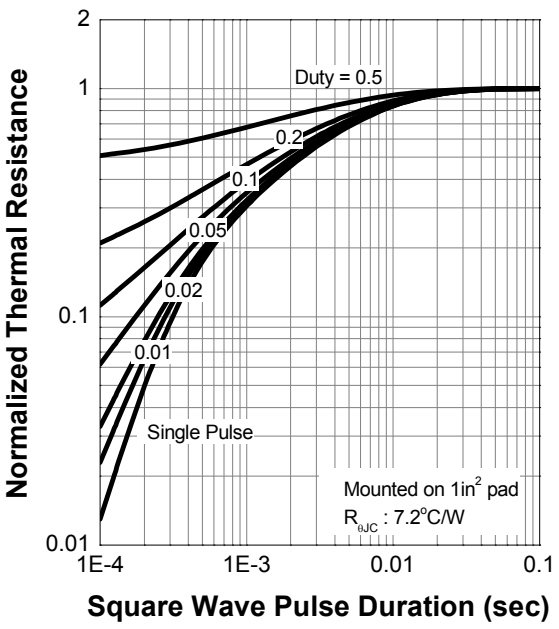
Current Capability



Safe Operation Area



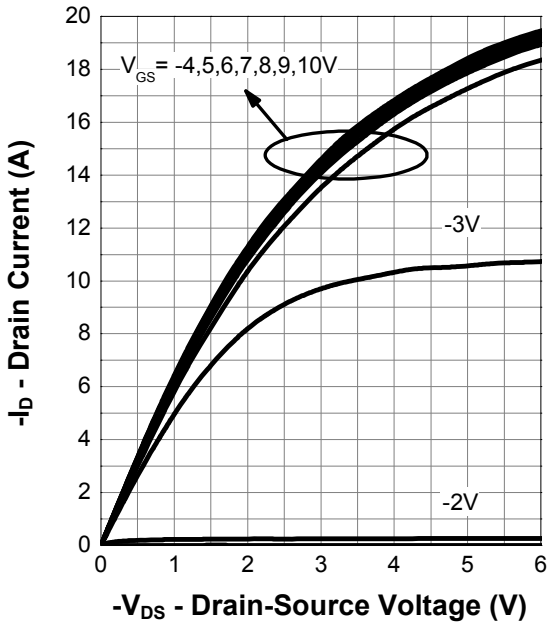
Transient Thermal Impedance



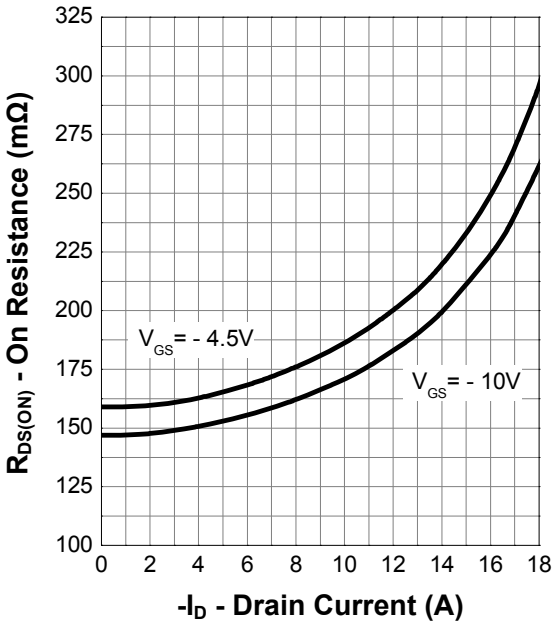
7. Typical Characteristics (Cont.)

P-channel:

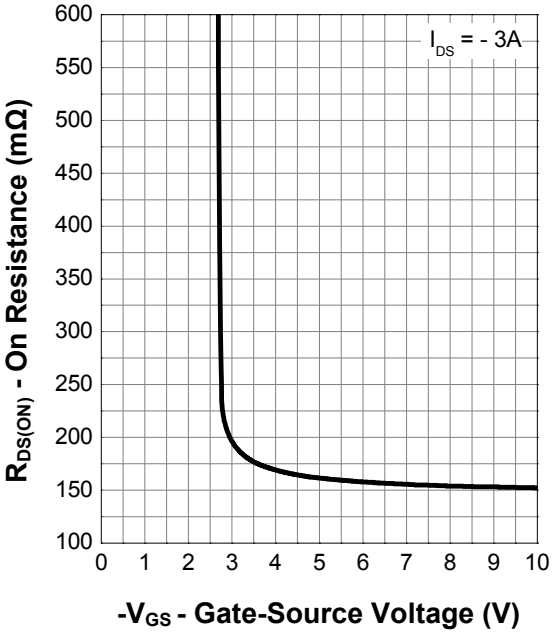
Output Characteristics



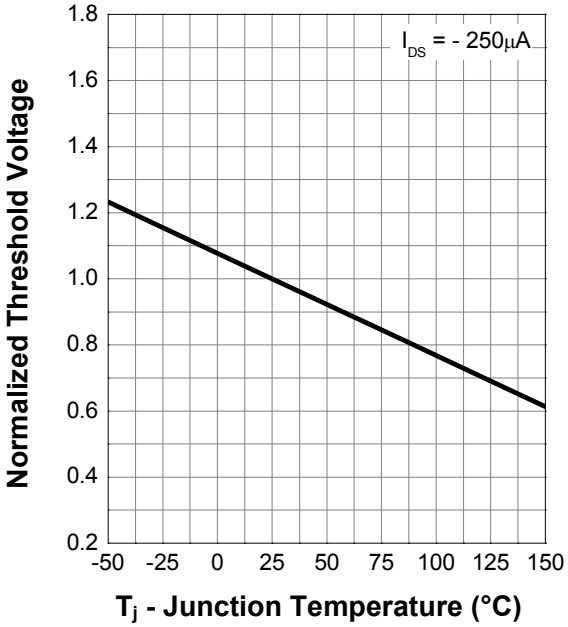
Drain-Source On Resistance



Transfer Characteristics



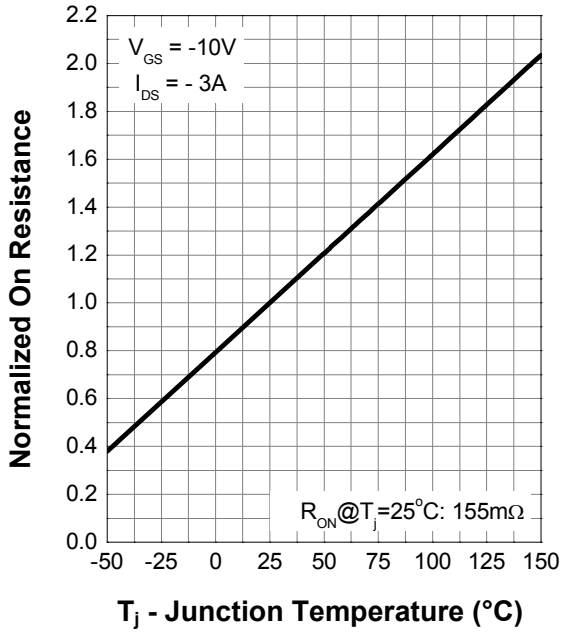
Normalized Threshold Voltage



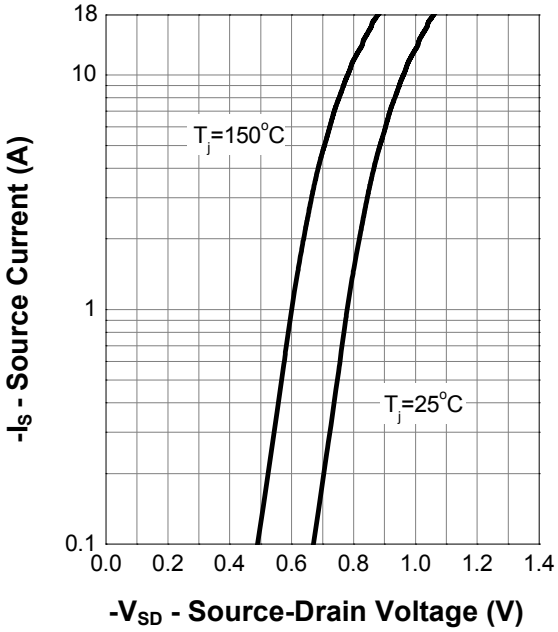
7. Typical Characteristics (Cont.)

P-channel:

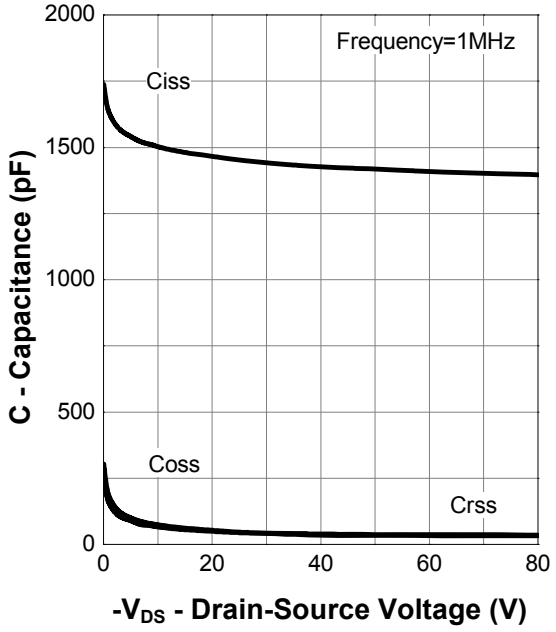
Normalized On Resistance



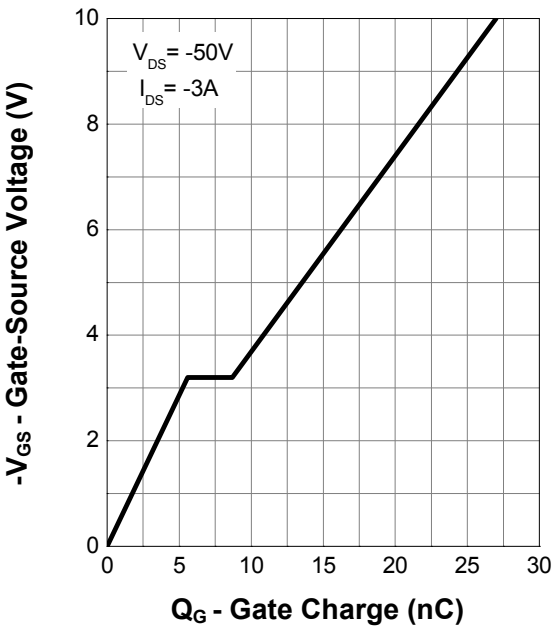
Diode Forward Current



Capacitance



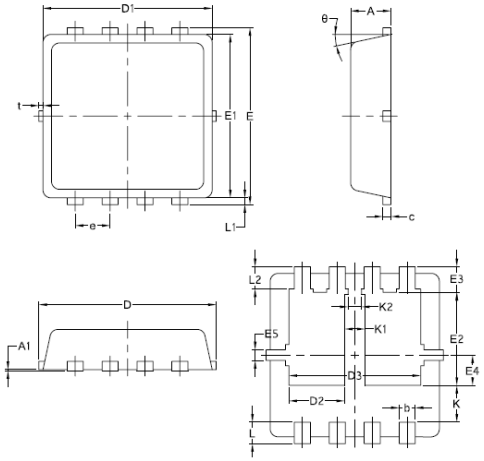
Gate Charge





8. Package Dimensions

PDFN 3.3x3.3-8L (Dual) Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	0.70	0.85
A1	/	0.05
b	0.25	0.39
c	0.14	0.20
D	3.20	3.45
D1	3.05	3.25
D2	0.84	1.24
D3	2.30	2.60
E	3.20	3.40
E1	2.95	3.15
E2	1.60	1.90
E3	0.28	0.65
E4	0.37	0.77
E5	0.10	0.30
e	0.60	0.70
K	0.50	0.80
K1	0.30	0.53
K2	0.15	0.35
L	0.30	0.50
L1	0.06	0.20
L2	0.27	0.57
t	0	0.13
θ	10°	14°