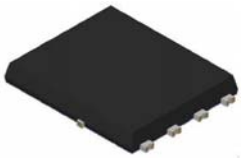
iM1639



N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

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

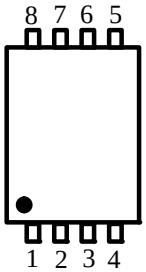
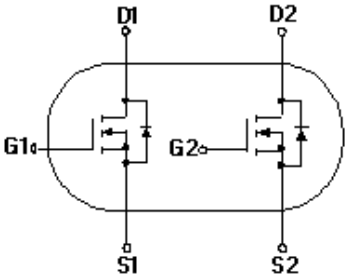
1.2 Applications

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

1.3 Quick reference

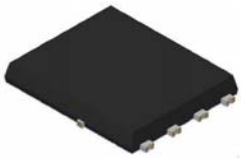
- ☑ BV ≧ 100 V
- ☑ P_{tot} ≦ 17 W
- ☑ I_D ≦ 9.4 A
- ☑ $R_{DS(ON)}$ ≦ 80 mΩ @ V_{GS} = 10 V
  $R_{DS(ON)}$ ≦ 90 mΩ @ V_{GS} = 4.5 V

Pin Description

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

Top View

PDFN5x6-8L



2. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_C = 25 ℃	-	100	V
V_{GS}	Gate-Source Voltage	T_C = 25 ℃	-	± 20	V
I_D*	Drain Current (DC)	T_C = 25 ℃, V_{GS} = 10 V	-	9.4	A
		T_C = 100 ℃, V_{GS} = 10 V	-	5.9	A
I_{DM}*,**	Drain Current (Pulsed)	T_C = 25 ℃, V_{GS} = 10 V	-	26	A
P_{tot}*	Total Power Dissipation	T_C = 25 ℃	-	17	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
I_S	Diode Forward Current	T_C = 25 ℃	-	9.4	A
E_{AS}*	Single Pulsed Avalanche Energy	V_{DD}= 50 V , L= 1.0 mH	-	42	mJ
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	60	℃ / W
$R_{\theta JC}$*	Thermal Resistance- Junction to Case		-	7.2	

Notes：

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

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

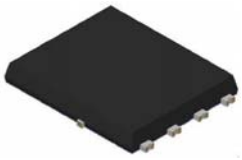
*** Limited by bonding wire

4. Marking Information

Product Name	Marking
iM1639	iM1639 XXXXX X : Date Code

5. Ordering Code

iM1639



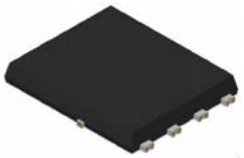
6. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_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	-	65	80	mΩ
		V_{GS} = 4.5 V, I_D = 2 A	-	70	90	
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	-	21	-	nS
Q_{rr}	Reverse Recovery Charge		-	23	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 50 V Frequency = 1 MHz	-	1618	-	pF
C_{oss}	Output Capacitance		-	34	-	
C_{rss}	Reverse Transfer Capacitance		-	23	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 50 V, V_{GEN} = 10 V, R_G = 3.9 Ω, R_L = 16.66 Ω, I_{DS} = 3 A	-	6.5	-	nS
t_r	Turn-on Rise Time		-	2.9	-	
t_d(off)	Turn-off Delay Time		-	32	-	
t_f	Turn-off Fall Time		-	9.1	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{GS} = 10 V, V_{DS} = 50 V, I_{DS} = 3 A	-	29	-	nC
Q_{gs}	Gate-Source Charge		-	6.9	-	
Q_{gd}	Gate-Drain Charge		-	3.2	-	

Notes :

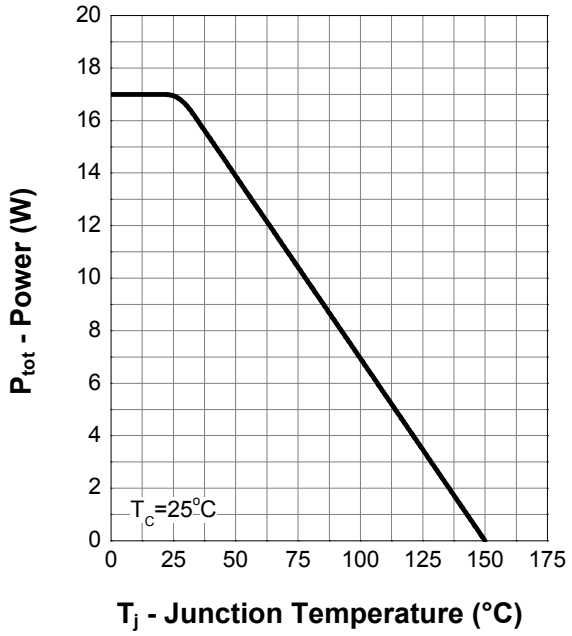
a : Pulse test ; pulse width ≤ 300 µs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

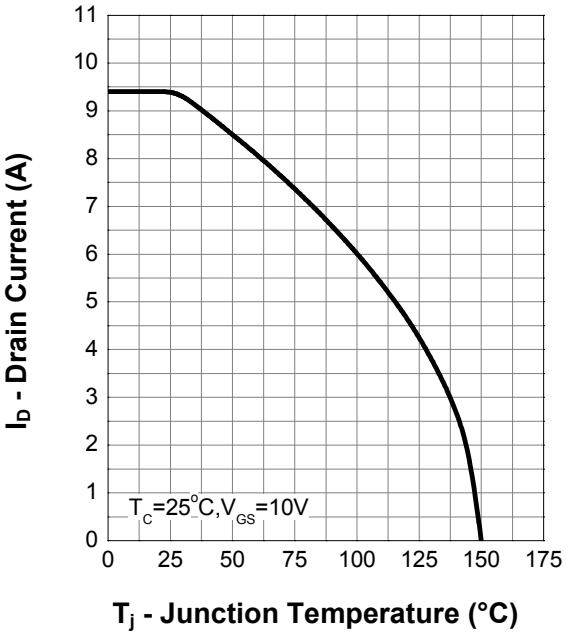


7. Typical Characteristics (Cont.)

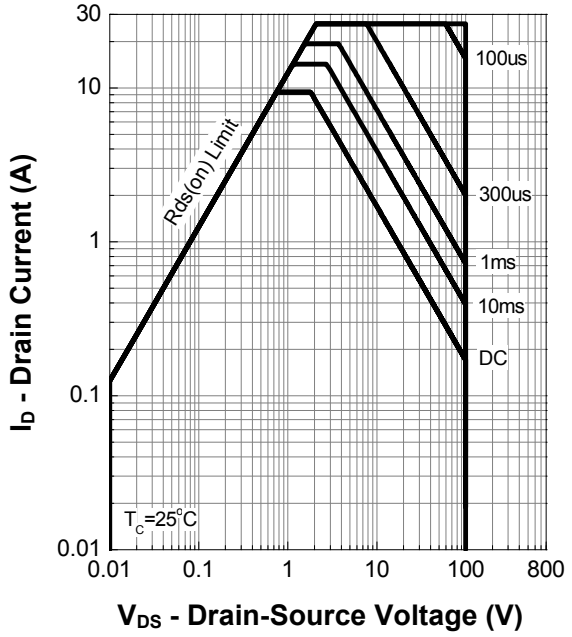
Power Capability



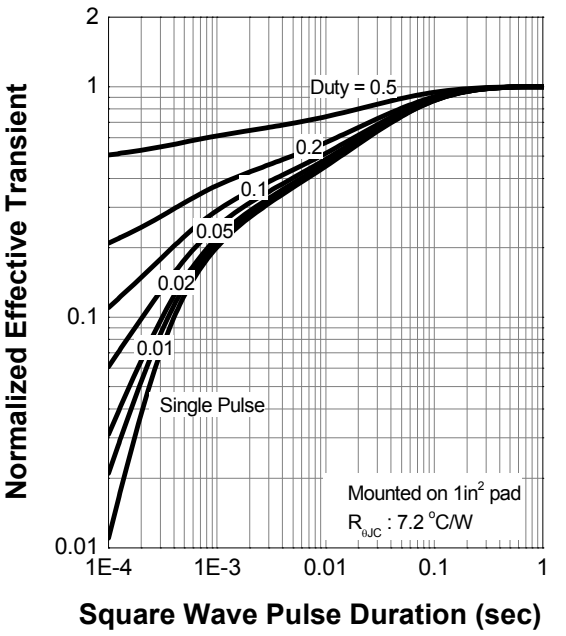
Current Capability

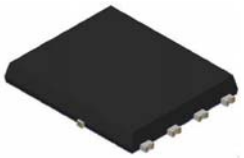


Safe Operation Area



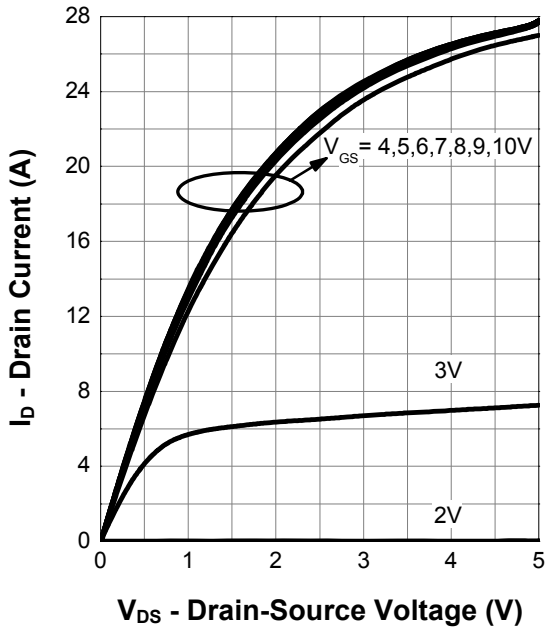
Transient Thermal Impedance



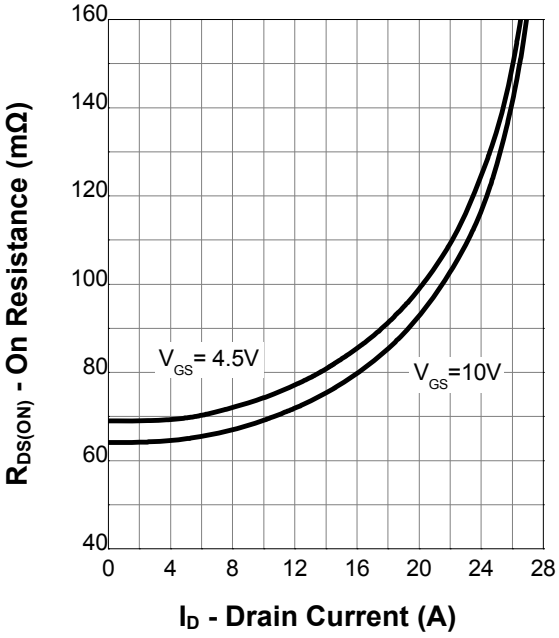


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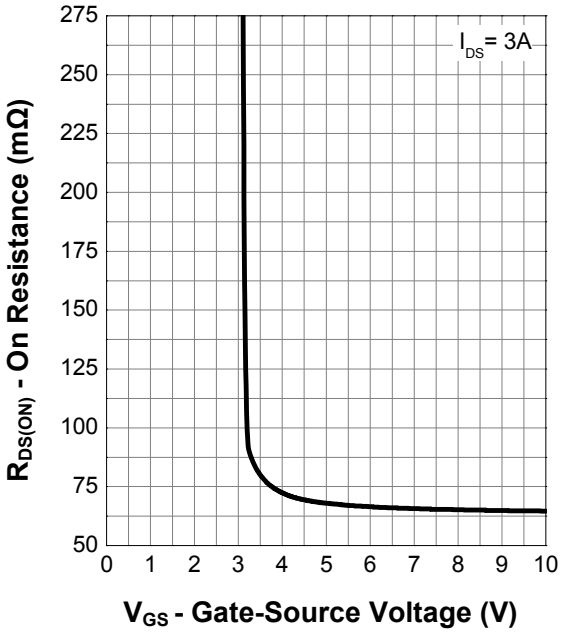
Output Characteristics



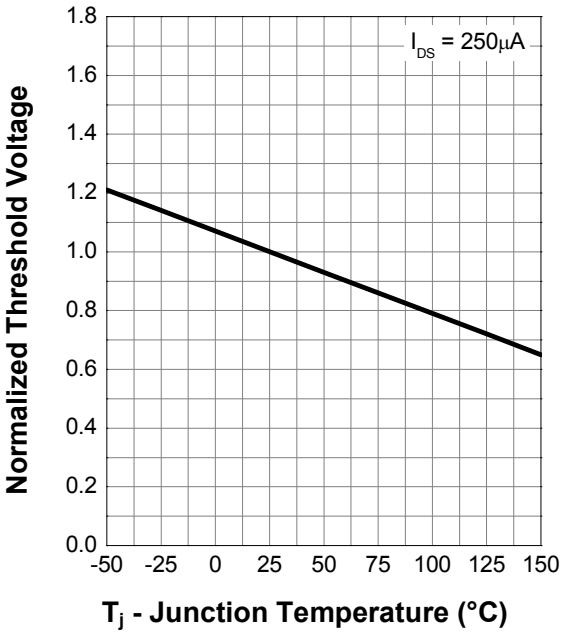
On Resistance

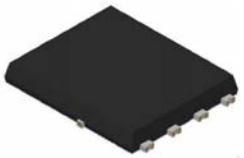


Transfer Characteristics



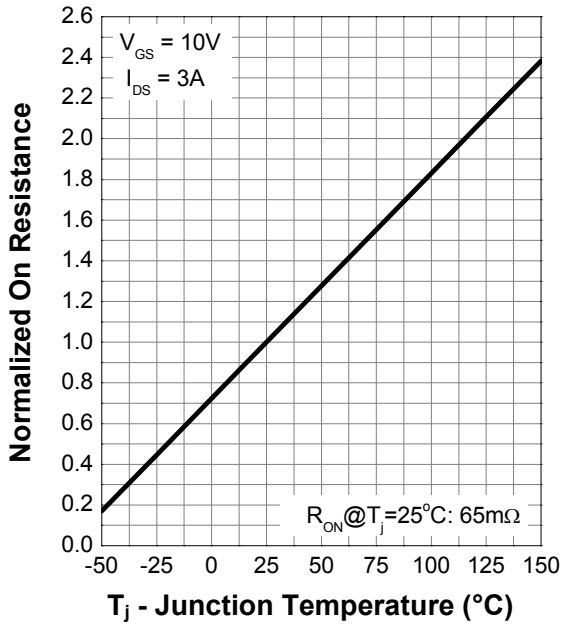
Normalized Threshold Voltage



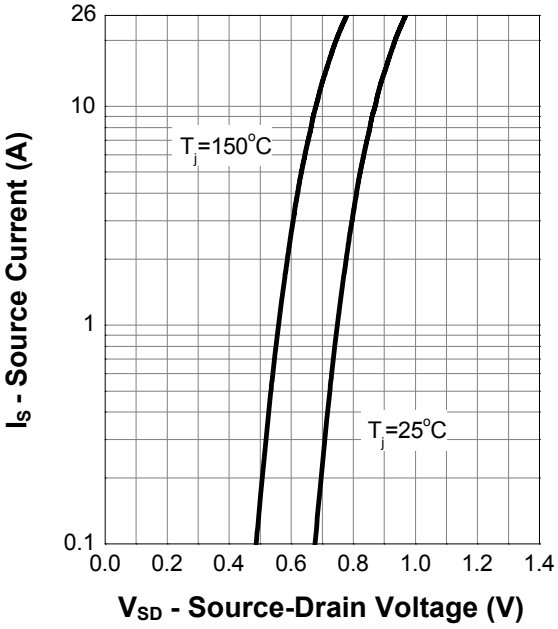


7. Typical Characteristics (Cont.)

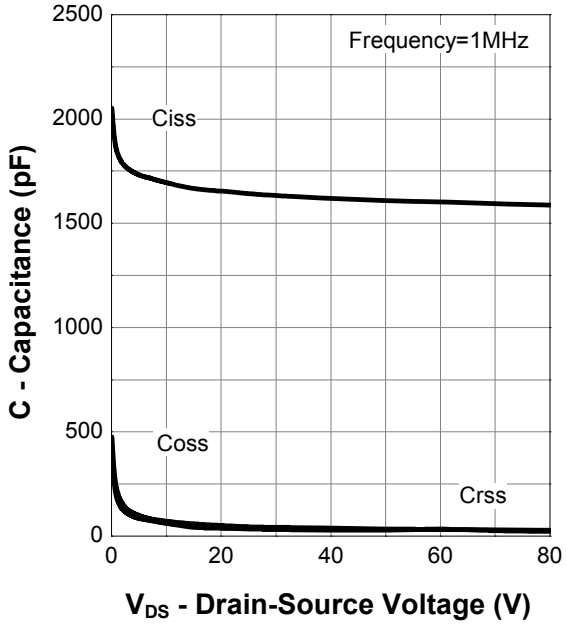
Normalized On Resistance



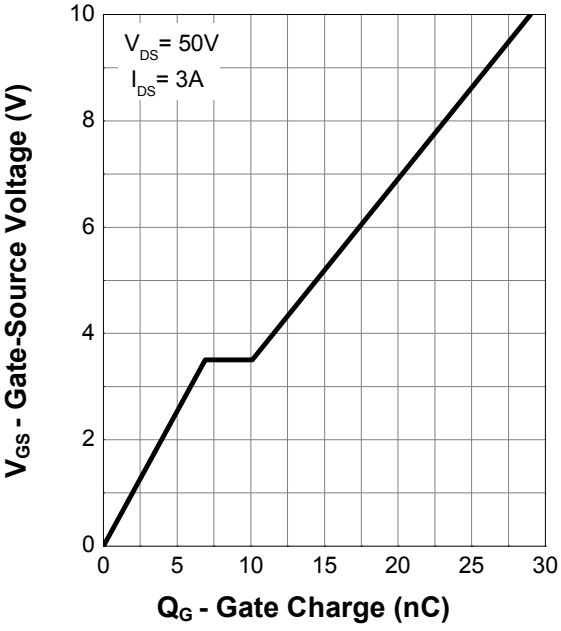
Diode Forward Current

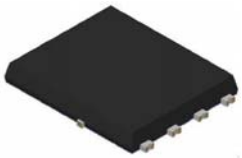


Capacitance



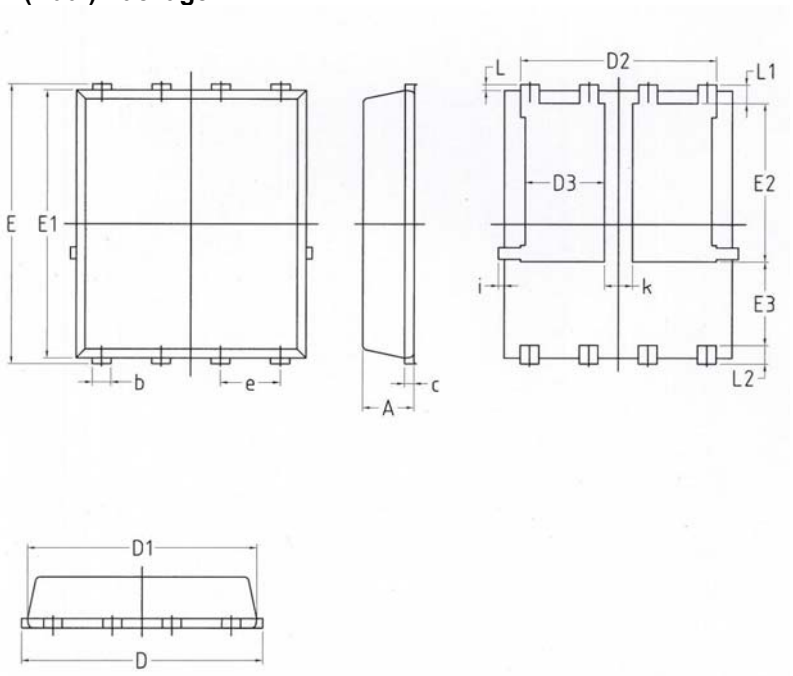
Gate Charge





8. Package Dimensions

PDFN5x6 - 8L (Dual) Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	1.03	1.17
B	0.34	0.48
c	0.203 BSC	
D	4.8	5.4
D1	4.8	5.0
D2	4.11	4.31
D3	1.6	1.8
E	5.95	6.15
E1	5.65	5.85
E2	3.3	3.5
E3	1.7	-
e	1.27 BSC	
L	0.05	0.25
L1	0.38	0.5
L2	0.38	0.5
i	-	0.18
k	0.5	0.7