iM2015



Dual N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

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

1.2 Applications

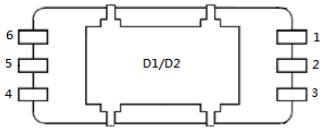
- ☑ Portable appliances
- ☑ Battery management

1.3 Quick reference

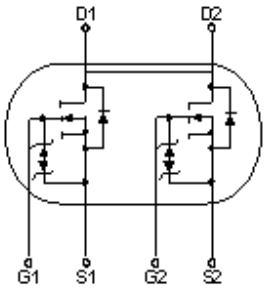
- ☑ BV ≧ 12 V
- ☑ P_{tot} ≦ 3.5 W
- ☑ I_D ≦ 19 A
- ☑ $R_{DS(ON)}$ ≦ 6.0 mΩ @ V_{GS} = 4.5 V
  $R_{DS(ON)}$ ≦ 6.4 mΩ @ V_{GS} = 3.7 V
  $R_{DS(ON)}$ ≦ 7.0 mΩ @ V_{GS} = 3.1 V
  $R_{DS(ON)}$ ≦ 8.1 mΩ @ V_{GS} = 2.5 V

2. Pin Description

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



Bottom View
PDFN2x5-6L





3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_A = 25 ℃	12	-	V
V_{GS}	Gate-Source Voltage	T_A = 25 ℃	-	± 10	V
I_D*	Drain Current	T_A = 25 ℃, V_{GS} = 10 V	-	19	A
I_{DM}*,**,***	Pulsed Drain Current	T_A = 25 ℃, V_{GS} = 10 V	-	64	A
P_{tot}	Total Power Dissipation	T_A = 25 ℃	-	3.5	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		- 55	150	℃
I_S	Diode Forward Current	T_A = 25 ℃	-	19	A
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	35	℃ / 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
iM2015	2015 XX

5. Ordering Code

iM2015 □ → Assembly Material	Assembly Material G: Halogen and Lead Free Device

Note: inergy defines “Green” as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC / JEDEC J-STD-020C)



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_{DS} = 250 µA	12	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = 250 µA	0.4	-	1.0	V
I_{DSS}	Drain Leakage Current	V_{DS} = 12V, V_{GS} = 0 V	-	-	1	µA
		T_J = 85 ℃	-	-	30	µA
I_{GSS}	Gate Leakage Current	V_{GS} = ±10 V, V_{DS} = 0 V	-	-	± 10	µA
$R_{DS(ON)}$[a]	On-State Resistance	V_{GS} = 4.5 V, I_{DS} = 12 A	-	4.6	6.0	mΩ
		V_{GS} = 3.7 V, I_{DS} = 10 A	-	4.9	6.4	
		V_{GS} = 3.1 V, I_{DS} = 8 A	-	5.4	7.0	
		V_{GS} = 2.5V, I_{DS} = 8 A	-	6.2	8.1	
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = 12 A, V_{GS} = 0V	-	-	1.2	V
Dyna10mic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = 6 V Frequency = 1 MHz	-	2150	-	pF
C_{oss}	Output Capacitance		-	579	-	
C_{rss}	Reverse Transfer Capacitance		-	539	-	
t_d(on)	Turn-on Delay Time	V_{DS} = 6 V, V_{GEN} = 4.5 V, R_G = 4.5 Ω, R_L = 0.5 Ω, I_{DS} = 12 A	-	372	-	nS
t_r	Turn-on Rise Time		-	984	-	
t_d(off)	Turn-off Delay Time		-	2167	-	
t_f	Turn-off Fall Time		-	2948	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{GS} = 4.5V, V_{DS} = 6 V, I_{DS} = 12 A	-	29	-	nC
Q_{gs}	Gate-Source Charge		-	2.8	-	
Q_{gd}	Gate-Drain Charge		-	8	-	

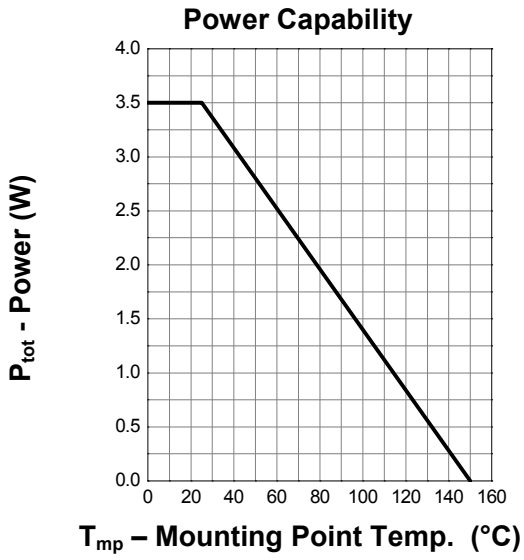
Notes :

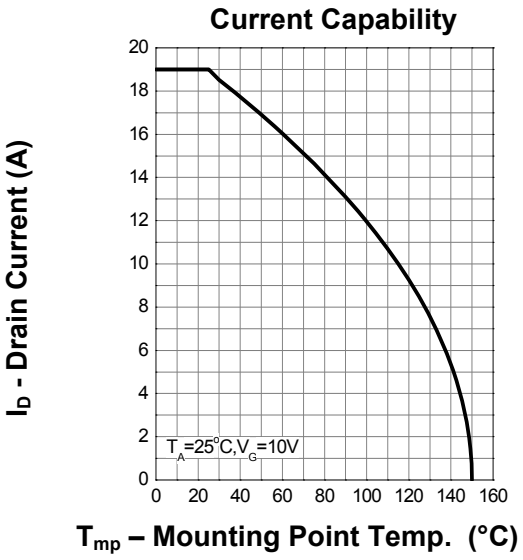
a : Pulse test ; pulse width ≤ 300 µs, duty cycle ≤ 2%

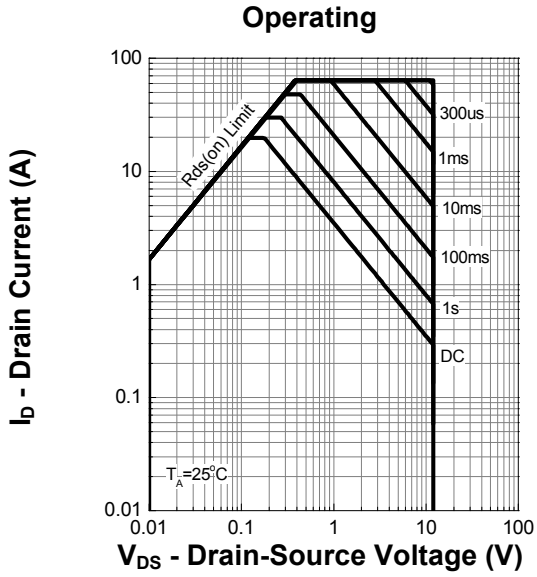
b : Guaranteed by design, not subject to production testing

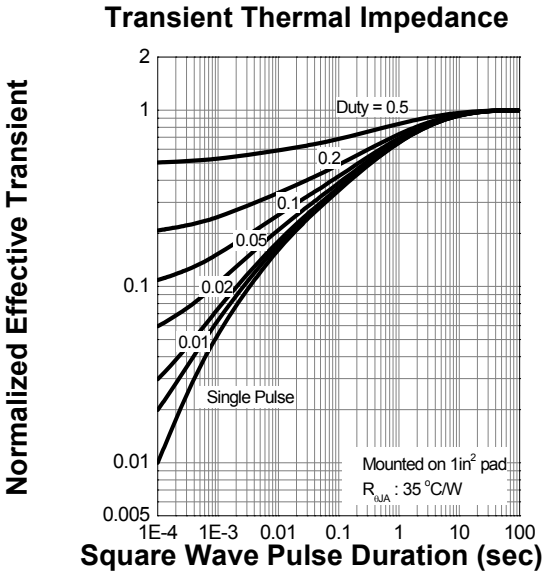


7. Typical Characteristics





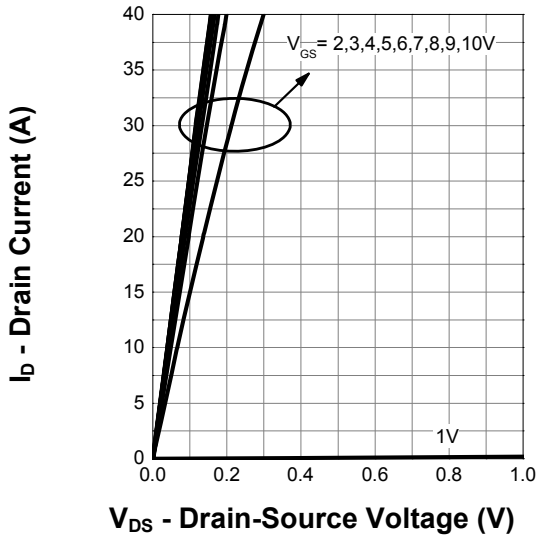




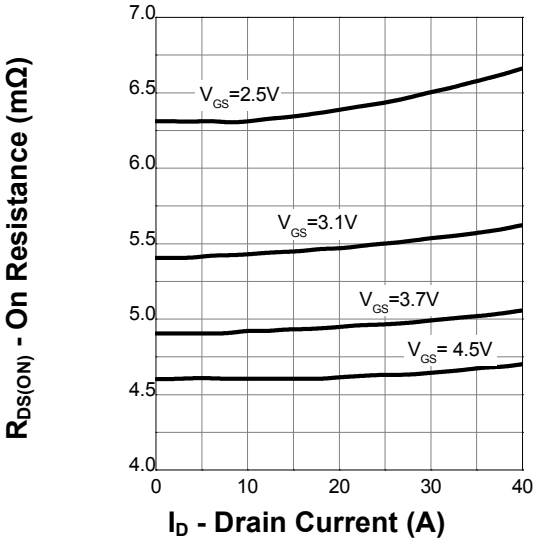


7. Typical Characteristics (cont.)

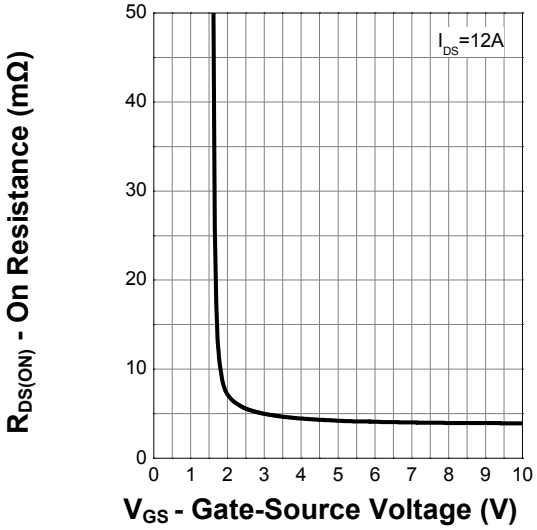
Output Characteristics



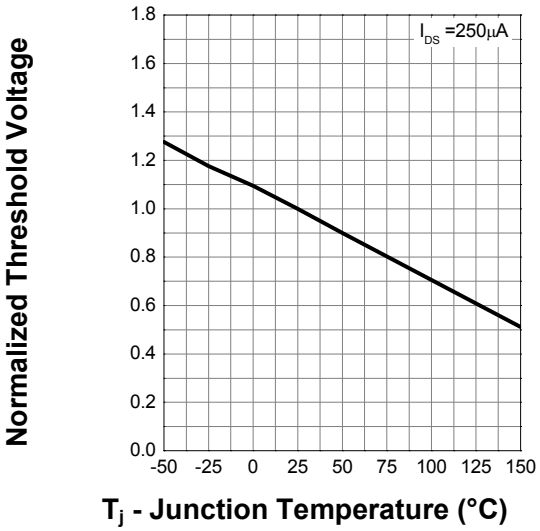
On Resistance



Transfer Characteristics



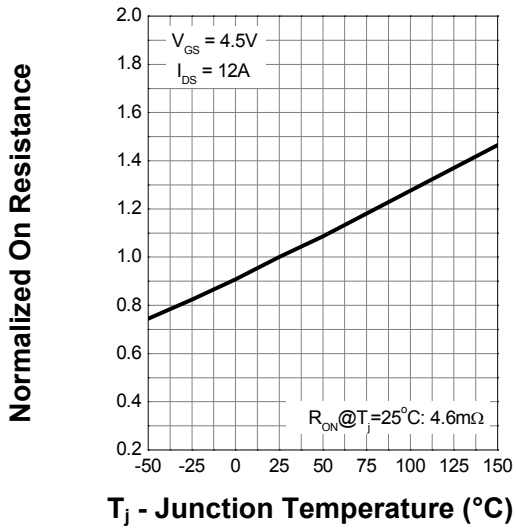
Normalized Threshold Voltage



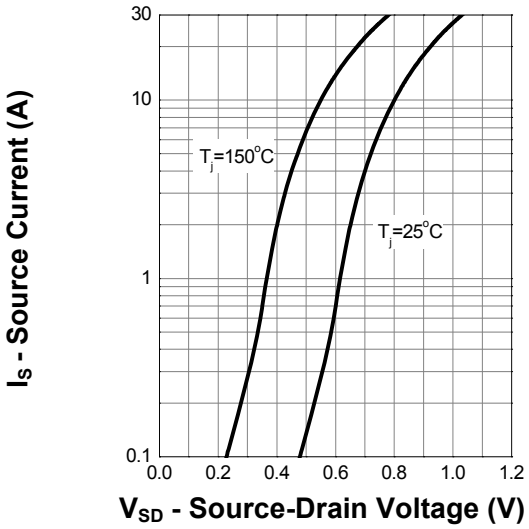


7. Typical Characteristics (cont.)

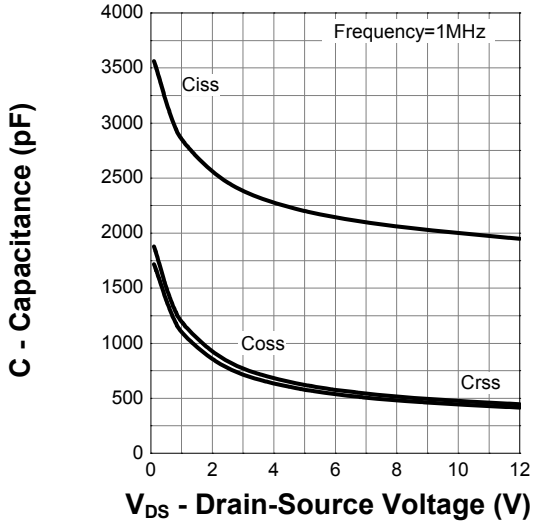
Normalized On Resistance



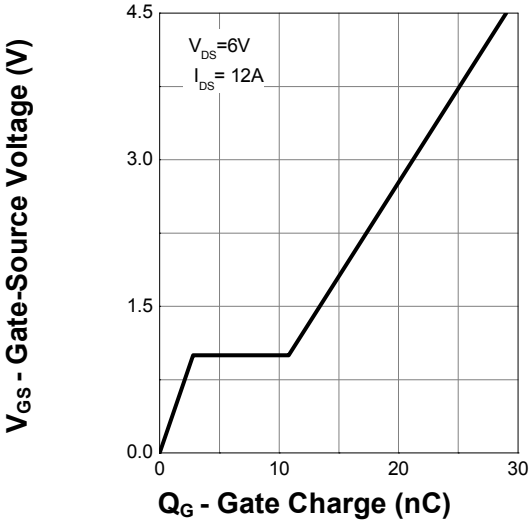
Diode Forward Current



Capacitance



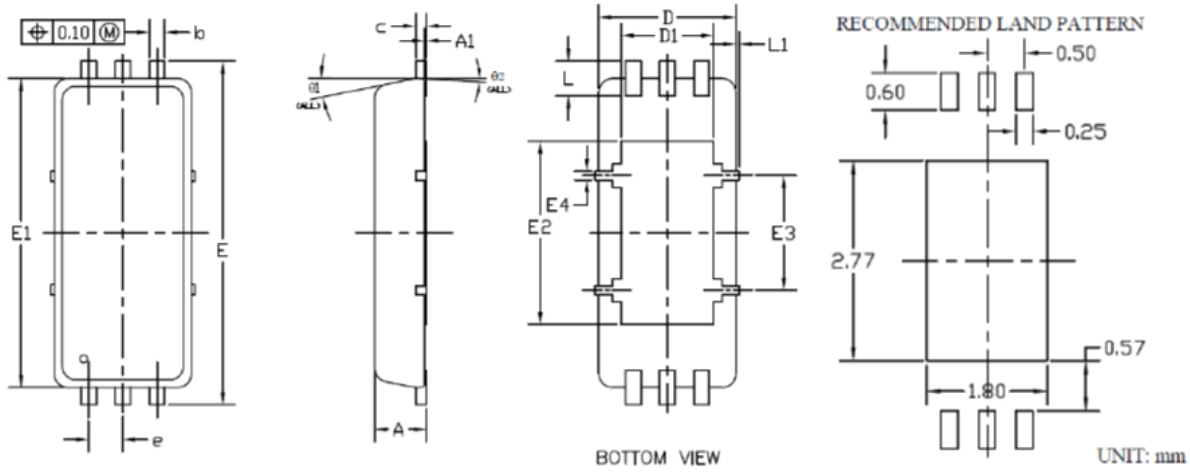
Gate Charge





8. Package Dimensions

PDFN2x5 - 6L Package



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
A1	0.00	---	0.05	0.000	---	0.002
b	0.20	0.23	0.30	0.008	0.009	0.012
c	0.10	0.15	0.20	0.004	0.006	0.008
D	1.90	2.00	2.10	0.075	0.079	0.083
D1	1.30	1.35	1.55	0.051	0.053	0.061
E	4.90	5.00	5.10	0.193	0.197	0.201
E1	4.40	4.50	4.60	0.173	0.177	0.181
E2	2.60	2.67	2.95	0.102	0.105	0.116
E3	1.62	1.67	1.72	0.064	0.066	0.068
E4	0.08	0.13	0.18	0.003	0.005	0.007
e	0.45	0.50	0.55	0.018	0.020	0.022
L	0.40	0.50	0.60	0.016	0.020	0.024
L1	0	---	0.10	0	---	0.004
θ1	0°	10°	12°	0°	10°	12°
θ2	0°	3°	5°	0°	3°	5°

NOTE
1. PAKCAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
   MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MIL EACH.
2. CONTROLLING DIMENSION IS MILLIMETER.
   CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.