iM1820



P-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☑ Advanced trench cell design
- ☑ Low Thermal Resistance

1.2 Applications

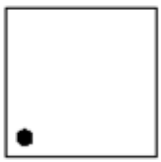
- ☑ Motor drivers
- ☑ DC - DC Converter

1.3 Quick reference

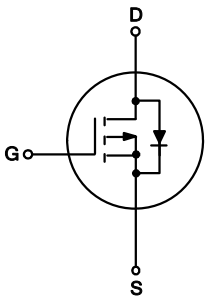
- ☑ BV ≧ - 100 V
- ☑ P_{tot} ≦ 20 W
- ☑ I_D ≦ - 11 A
- ☑ $R_{DS(ON)}$ ≦ 74 mΩ @ V_{GS} = - 10 V
- ☑ $R_{DS(ON)}$ ≦ 83 mΩ @ V_{GS} = - 4.5 V

2. Pin Description

Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain



Top View
DFN3.3x3.3-8L





3. 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	-	- 11	A
		T_C = 100 ℃, V_{GS} = -10 V	-	- 7	A
I_{DM}***	Drain Current (Pulsed)	T_C = 25 ℃, V_{GS} = - 10 V	-	- 44	A
P_{tot}	Total Power Dissipation	T_C = 25 ℃	-	20	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		-	150	℃
I_S	Diode Forward Current	T_C = 25 ℃	-	- 11	A
E_{AS}	Single Pulsed Avalanche Energy	V_{DD}= - 50 V , L= 1.0 mH	-	128	mJ
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	74	℃ / W
$R_{\theta JC}$	Thermal Resistance- Junction to Ambient		-	6.3	

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
iM1820	iM1820 XXXXX X : Date Code

5. Ordering Code

iM1820



6. Electrical Characteristics (T_C = 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	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 = - 10 A	-	60	74	mΩ
		V_{GS} = - 4.5 V, I_D = - 5 A	-	64	83	mΩ
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = - 10 A, V_{GS} = 0 V	-	-	-1.1	V
t_{rr}	Reverse Recovery Time	I_{SD} = - 10 A, dI_{SD}/dt = 100 A/µs	-	29	-	nS
Q_{rr}	Reverse Recovery Charge		-	44	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = - 50 V Frequency = 1 MHz	-	4363	-	pF
C_{oss}	Output Capacitance		-	95	-	
C_{rss}	Reverse Transfer Capacitance		-	59	-	
t_d(on)	Turn-on Delay Time	V_{DS} = - 50 V, V_{GEN} = - 10 V, R_G = 3.9 Ω, R_L = 5 Ω, I_D = - 10 A	-	8	-	nS
t_r	Turn-on Rise Time		-	13	-	
t_d(off)	Turn-off Delay Time		-	121	-	
t_f	Turn-off Fall Time		-	42	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{DS} = -50 V, V_{GS} = -10 V, I_{DS} = -10 A	-	76	-	nC
Q_{gs}	Gate-Source Charge		-	16	-	
Q_{gd}	Gate-Drain Charge		-	8.4	-	

Notes :

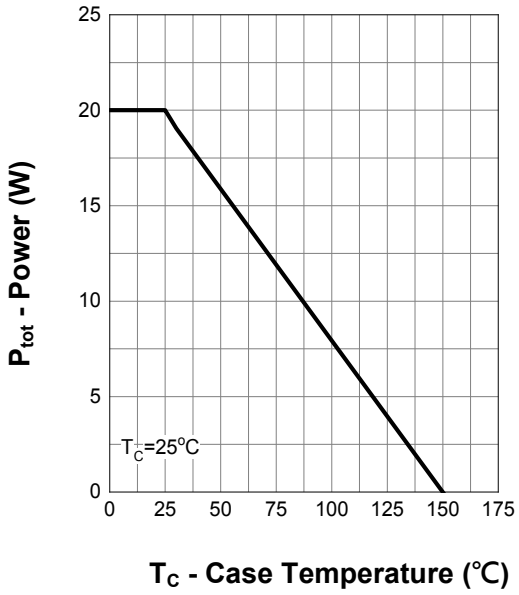
a : Pulse test ; pulse width ≤ 300 µs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

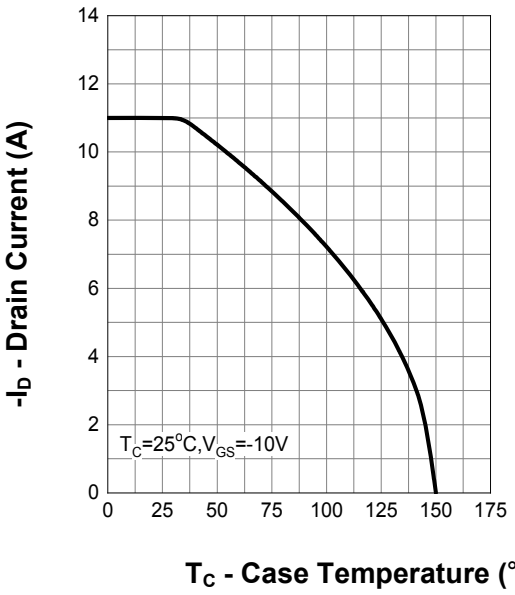


7. Typical Characteristics

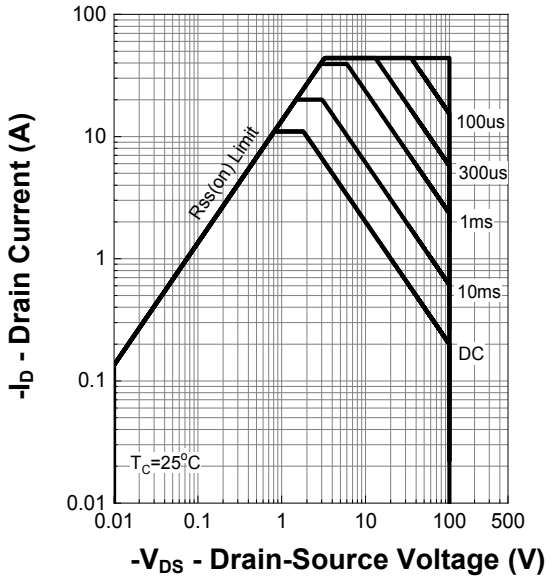
Power Capability



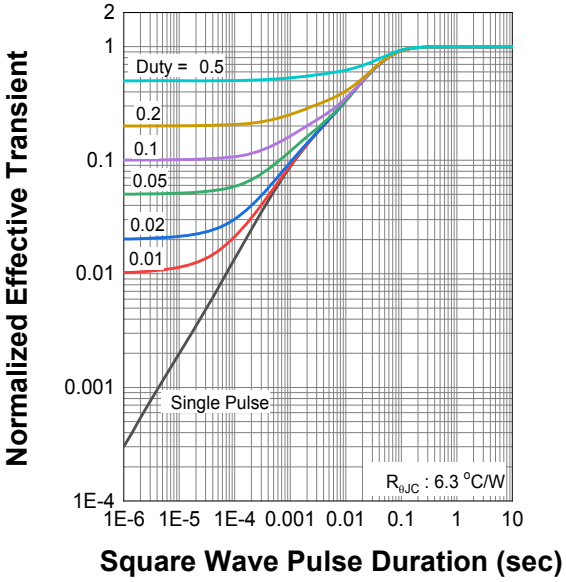
Current Capability



Safe Operation Area



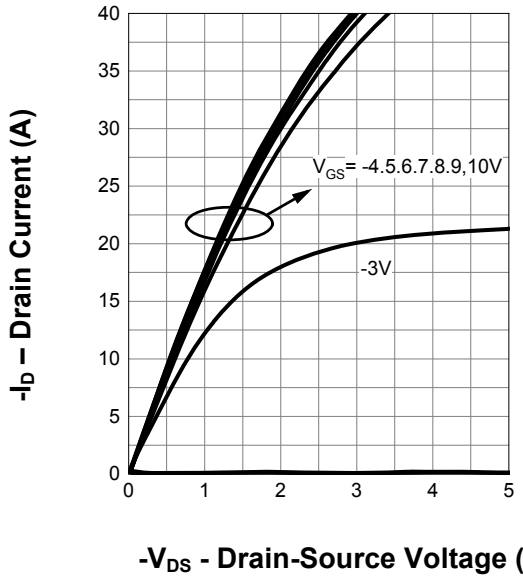
Thermal Transient Impedance



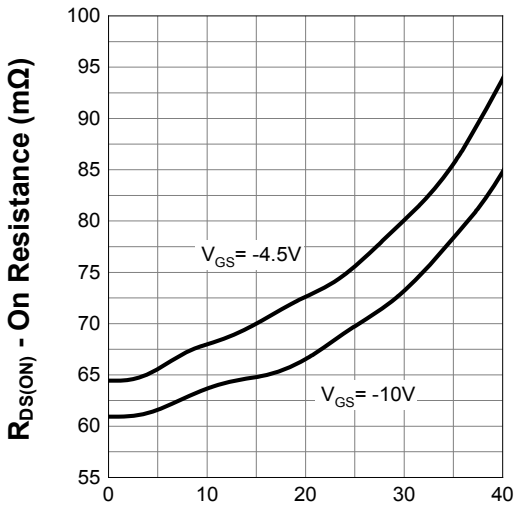


7. Typical Characteristics (cont.)

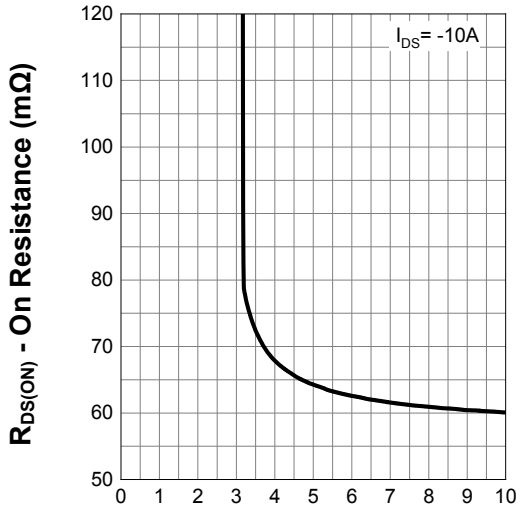
Output Characteristics



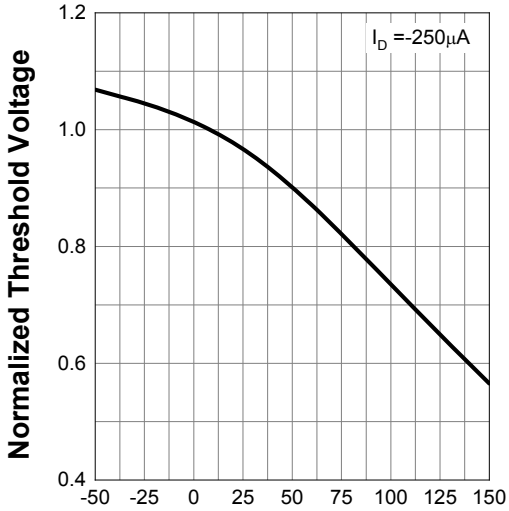
Drain-Source On Resistance



Transfer Characteristics



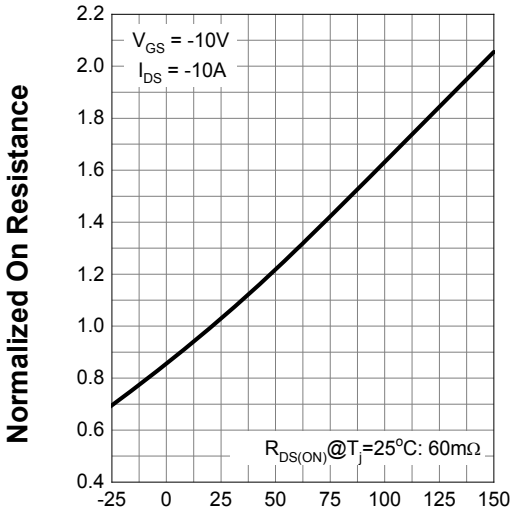
Gate Threshold Voltage



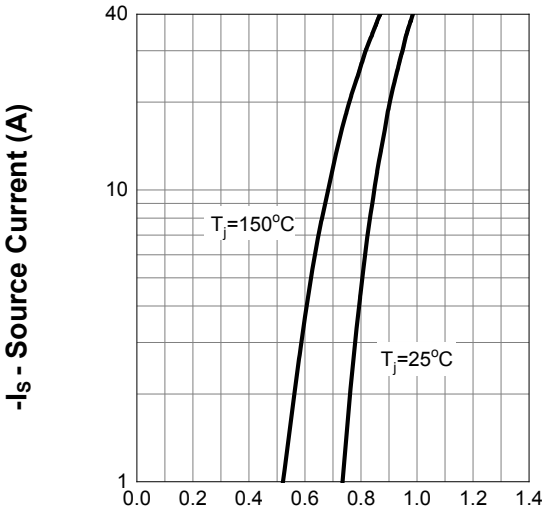


7. Typical Characteristics (cont.)

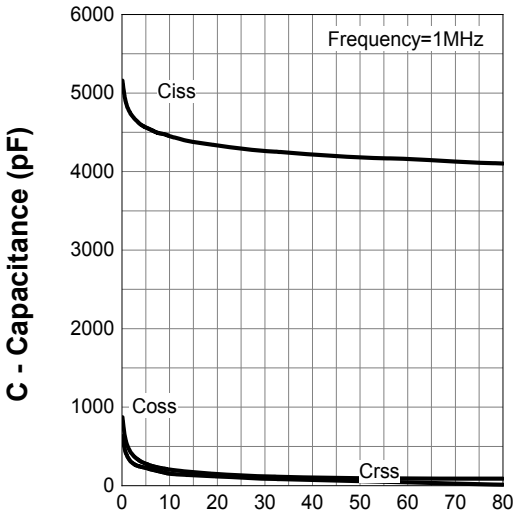
Drain-Source On Resistance



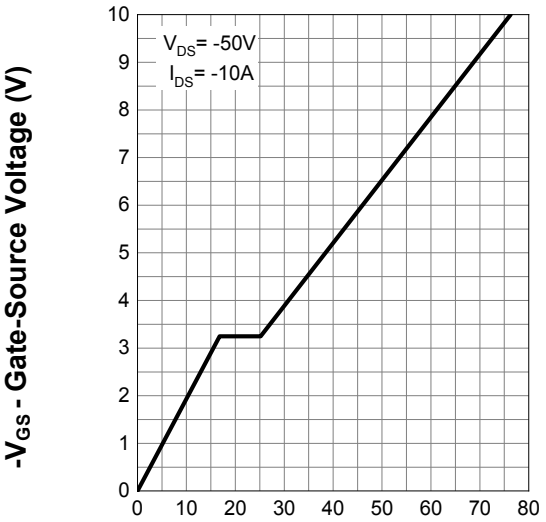
Body Diode Characteristics



Capacitance



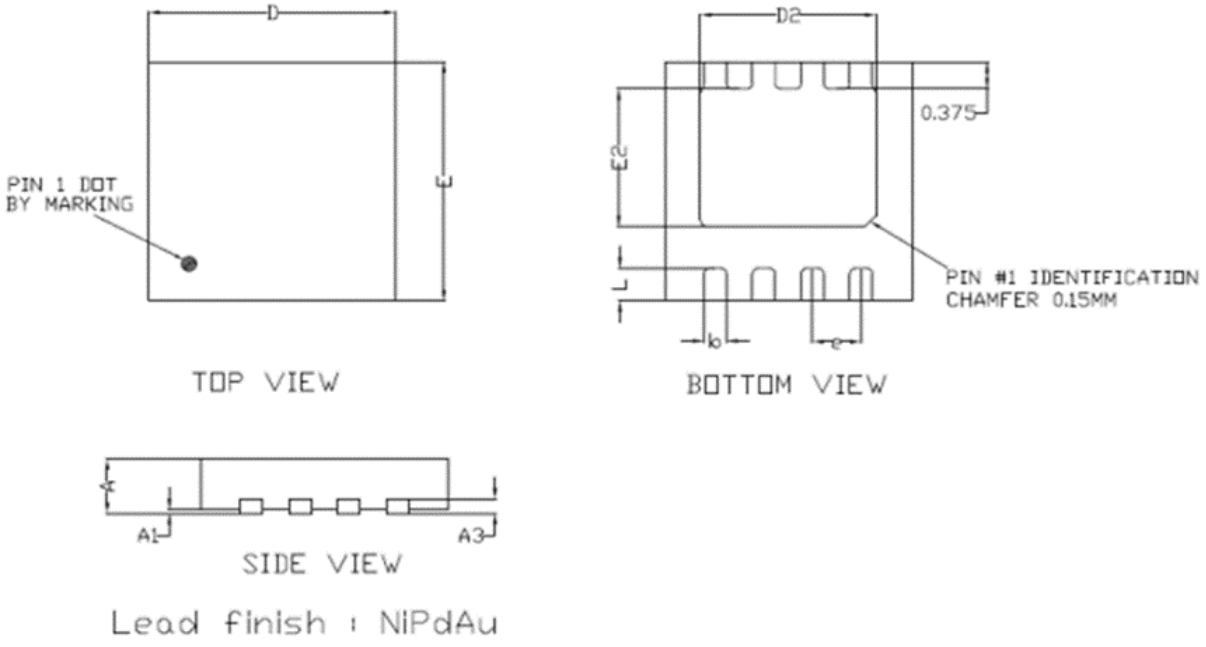
Gate Charge





8. Package Dimensions

DFN3.3x3.3 - 8L Package



SYMBOL	Unit : mm		Unit : inch	
	MIN	MAX	MIN	MAX
A	0.70	0.8	0.028	0.031
A1	0	0.05	0.000	0.002
A3	0.2REF		0.008REF	
D	3.2	3.4	0.126	0.134
E	3.20	3.4	0.126	0.134
D2	2.3	2.85	0.091	0.112
E2	1.85	2.25	0.073	0.089
b	0.25	0.4	0.010	0.016
L	0.35	0.6	0.014	0.024
e	0.65BSC		0.026BSC	