

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Advanced trench cell design
- Super Trench
- Tj Max 175°C
- Low Thermal Resistance
- MSL1

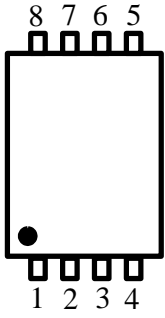
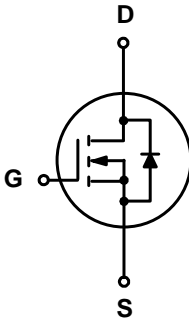
#### 1.2 Applications

- Motor drivers
- DC - DC Converter

#### 1.3 Quick reference

- $BV \geq 120\text{ V}$
- $P_{tot} \leq 35\text{ W}$
- $I_D \leq 120\text{ A}$
- $R_{DS(ON)} \leq 5.5\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- $R_{DS(ON)} \leq 7.5\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 <p>Top View PDFN5x6-8L</p>	
4	Gate		
5,6,7,8	Drain		



### 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V <sub>DS</sub>	Drain-Source Voltage	T <sub>C</sub> = 25 °C	120	-	V
V <sub>GS</sub>	Gate-Source Voltage	T <sub>C</sub> = 25 °C	-	± 20	V
I <sub>D</sub> *	Drain Current ( DC )	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	120	A
		T <sub>C</sub> = 100 °C, V <sub>GS</sub> = 10 V	-	33	A
I <sub>DM</sub> **	Drain Current ( Pulsed )	T <sub>C</sub> = 25 °C, V <sub>GS</sub> = 10 V	-	208	A
P <sub>tot</sub> *	Total Power Dissipation	T <sub>C</sub> = 25 °C	-	35	W
T <sub>stg</sub>	Storage Temperature		- 55	175	°C
T <sub>J</sub>	Junction Temperature		-	175	°C
I <sub>S</sub>	Diode Forward Current	T <sub>C</sub> = 25 °C	-	120	A
E <sub>AS</sub> *	Single Pulsed Avalanche Energy	V <sub>DD</sub> = 50 V, L= 1 mH	-	722	mJ
R <sub>θJA</sub> *	Thermal Resistance- Junction to Ambient		-	62.5	°C / W
R <sub>θJC</sub> *	Thermal Resistance- Junction to Case		-	3.5	

Notes :

- \* Surface Mounted on 1 in<sup>2</sup> pad area, t ≤ 10 sec
- \*\* Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- \*\*\* Limited by bonding wire

### 4. Marking Information

Product Name	Marking
KJ0512G	<div style="display: inline-block; border: 1px solid black; padding: 2px;">0512 YWWXXX</div> <span style="margin-left: 20px;">YWWXXX: Date Code</span>

### 5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
KJN0512G	PDFN5*6			5000	

Note: KUAJIJIXIN 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<sub>A</sub> = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	120	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>DS</sub> = 250 μA	1	-	3	V
I <sub>DSS</sub>	Zero Gate Voltage Source Current	V <sub>DS</sub> = 96 V, V <sub>GS</sub> = 0 V	-	-	1	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> = ± 20 V, V <sub>DS</sub> = 0 V	-	-	± 100	nA
R <sub>DS(ON)</sub> <sup>a</sup>	Drain-Source On-State Resistance	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A	-	4.8	5.5	mΩ
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 20 A	-	6.5	7.5	
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> = 30 A, V <sub>GS</sub> = 0 V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> = 30 A, dI <sub>SD</sub> /dt = 100 A/μs	-	89	-	nS
Q <sub>rr</sub>	Reverse Recovery Charge		-	271	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 60 V Frequency = 1 MHz	-	4233	-	pF
C <sub>oss</sub>	Output Capacitance		-	563	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	40	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> = 60 V, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 3.9 Ω, R <sub>L</sub> = 2 Ω, I <sub>DS</sub> = 30 A	-	12	-	nS
t <sub>r</sub>	Turn-on Rise Time		-	27	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	55	-	
t <sub>f</sub>	Turn-off Fall Time		-	38	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> = 60 V, V <sub>GS</sub> = 10 V, I <sub>DS</sub> = 30 A	-	71	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	17	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	16	-	

Notes :

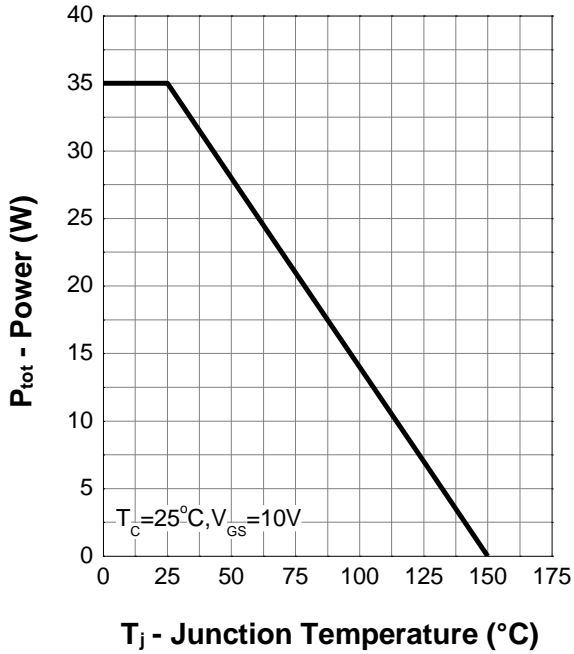
a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2 %

b : Guaranteed by design, not subject to production testing

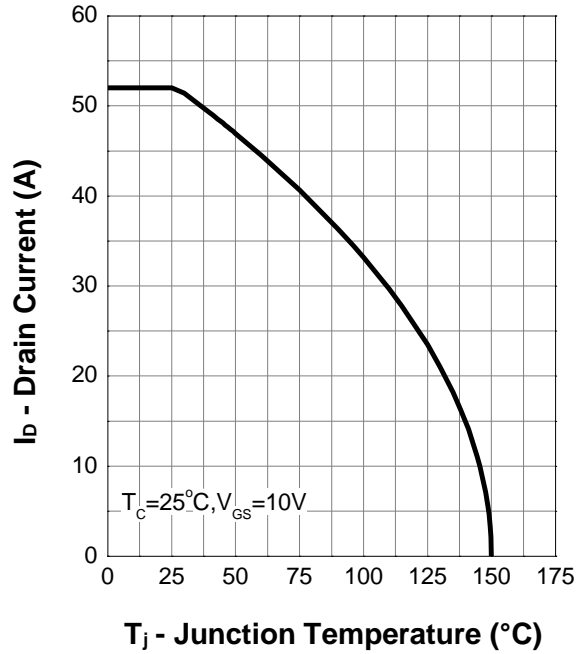


### 7. Typical Characteristics (Cont.)

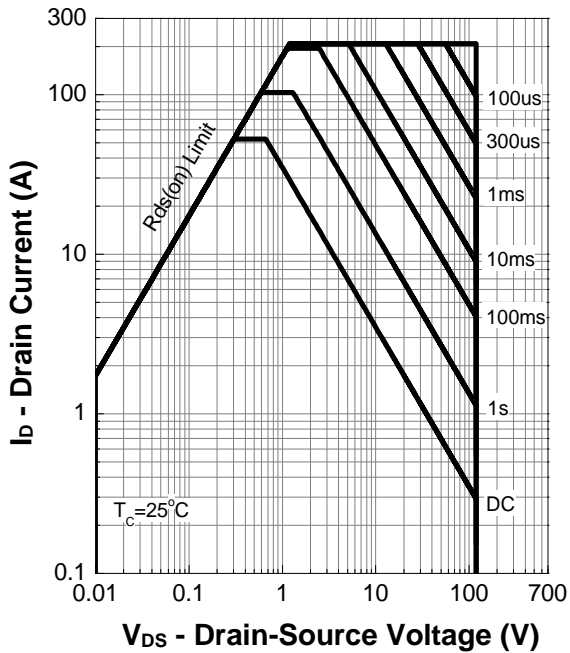
Power Capability



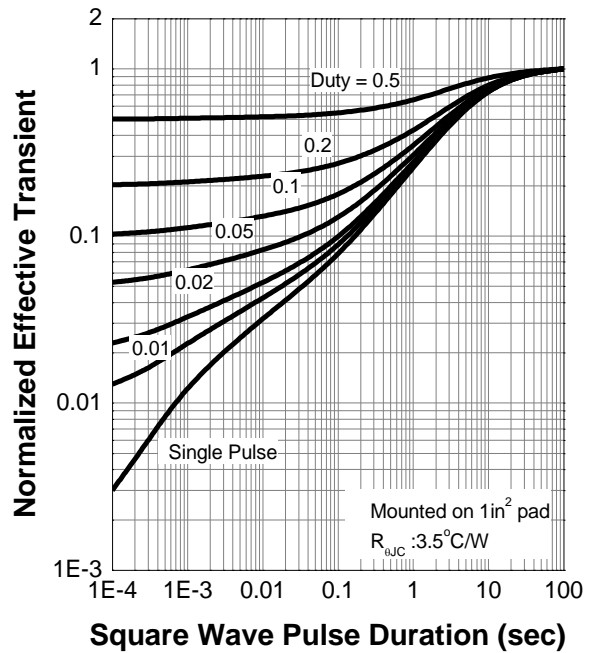
Current Capability



Safe Operating Area



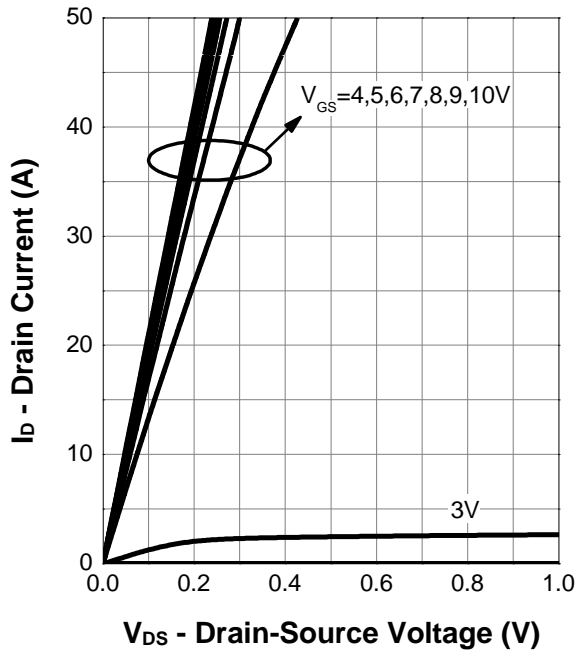
Transient Thermal Impedance



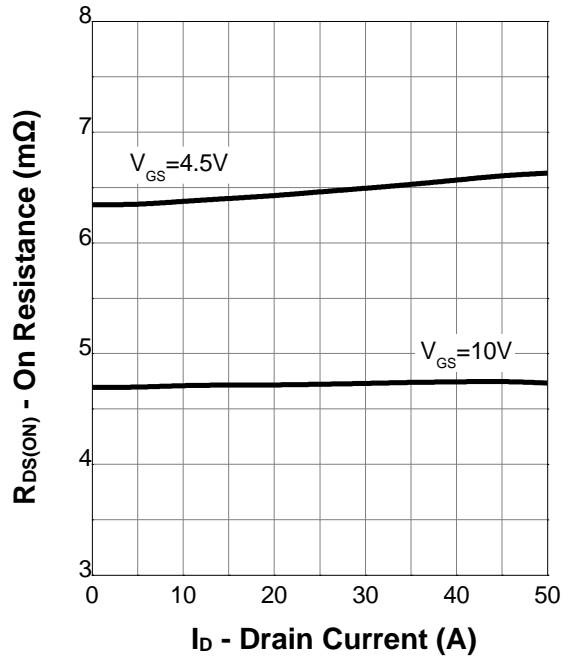


### 7. Typical Characteristics (Cont.)

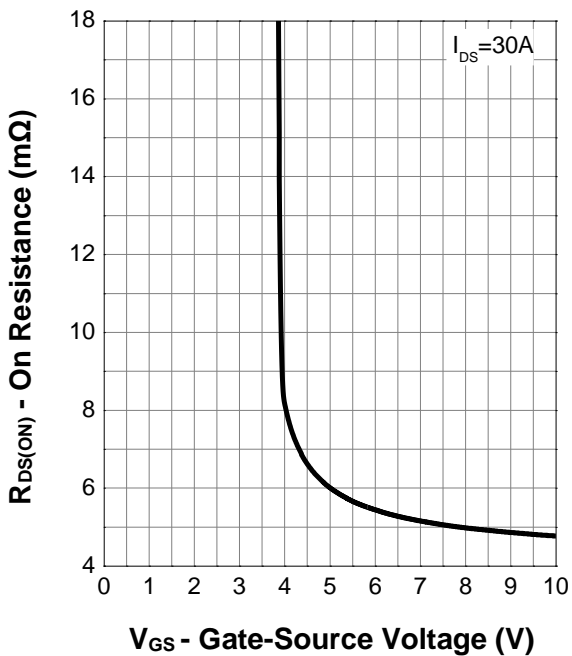
Output Characteristics



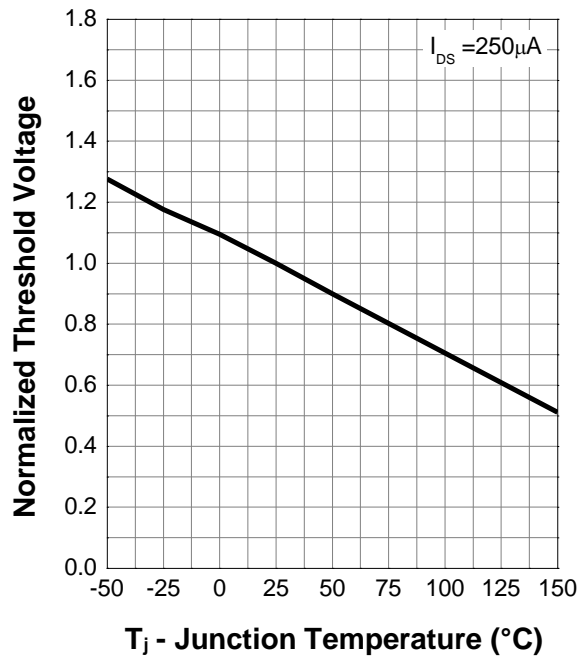
On Resistance



Transfer Characteristics



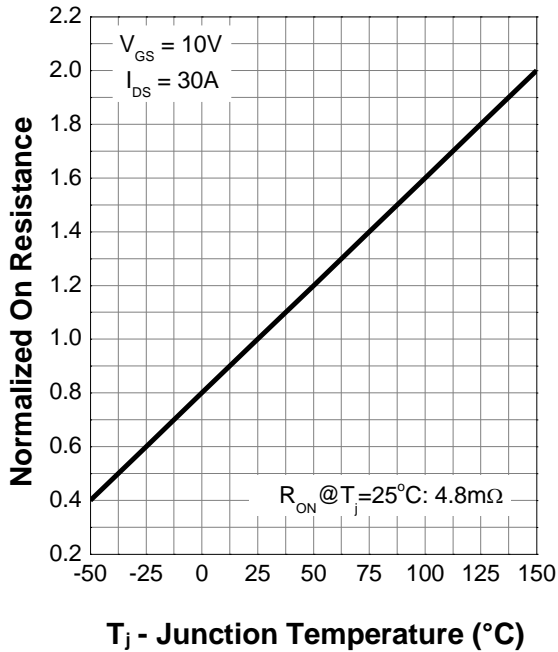
Normalized Threshold Voltage



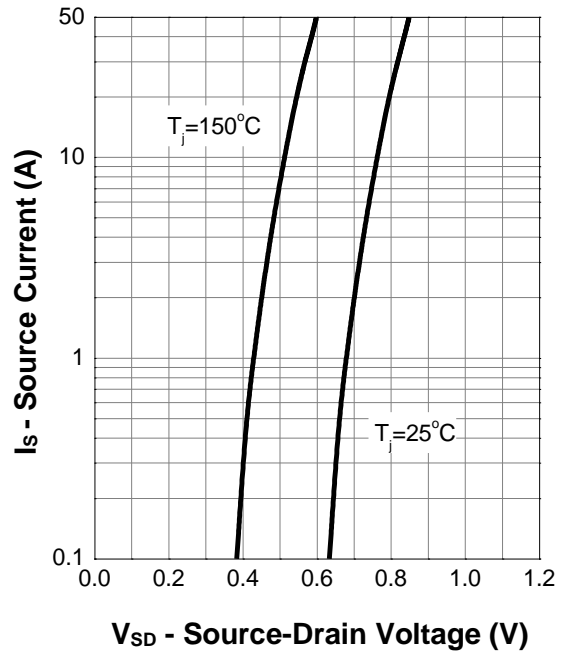


### 7. Typical Characteristics (Cont.)

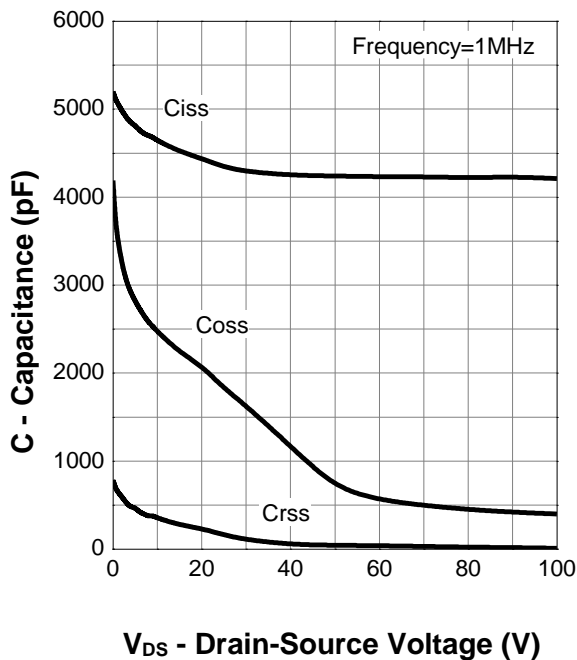
Normalized On Resistance



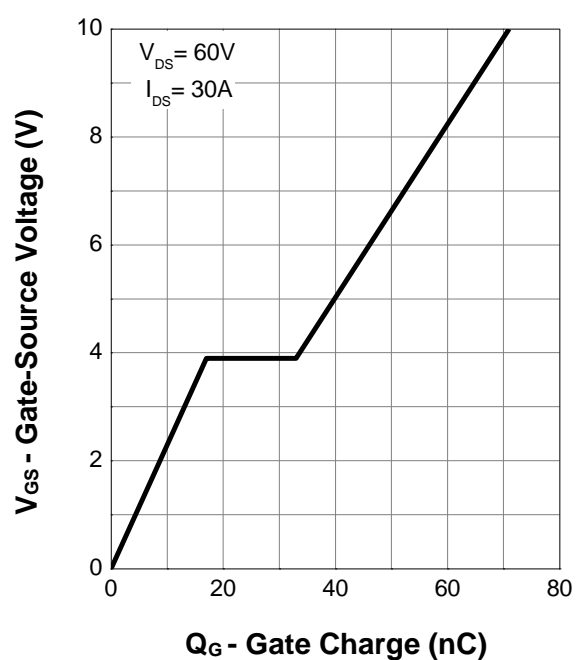
Diode Forward Current



Capacitance



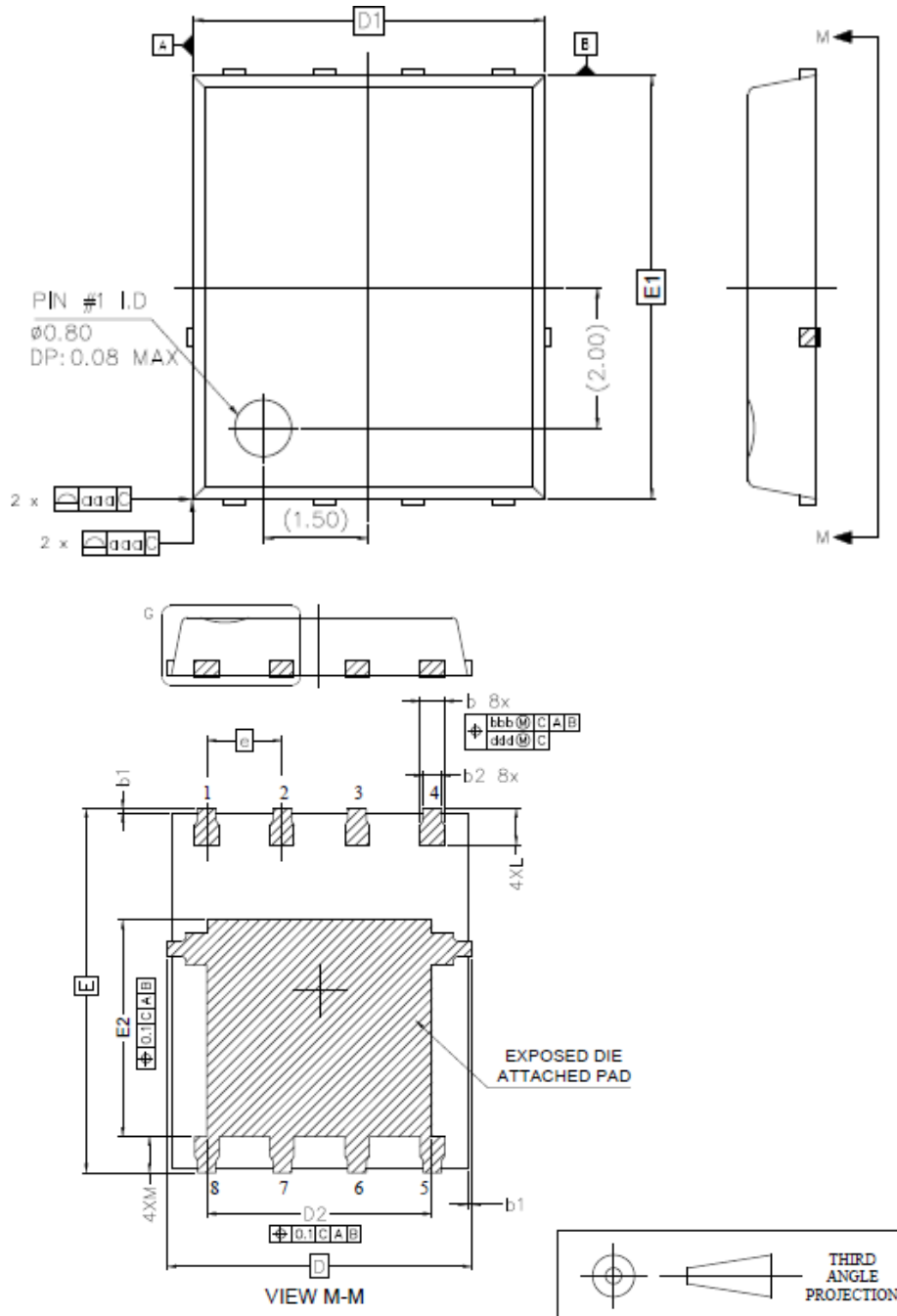
Gate Charge





### 8. Package Dimensions

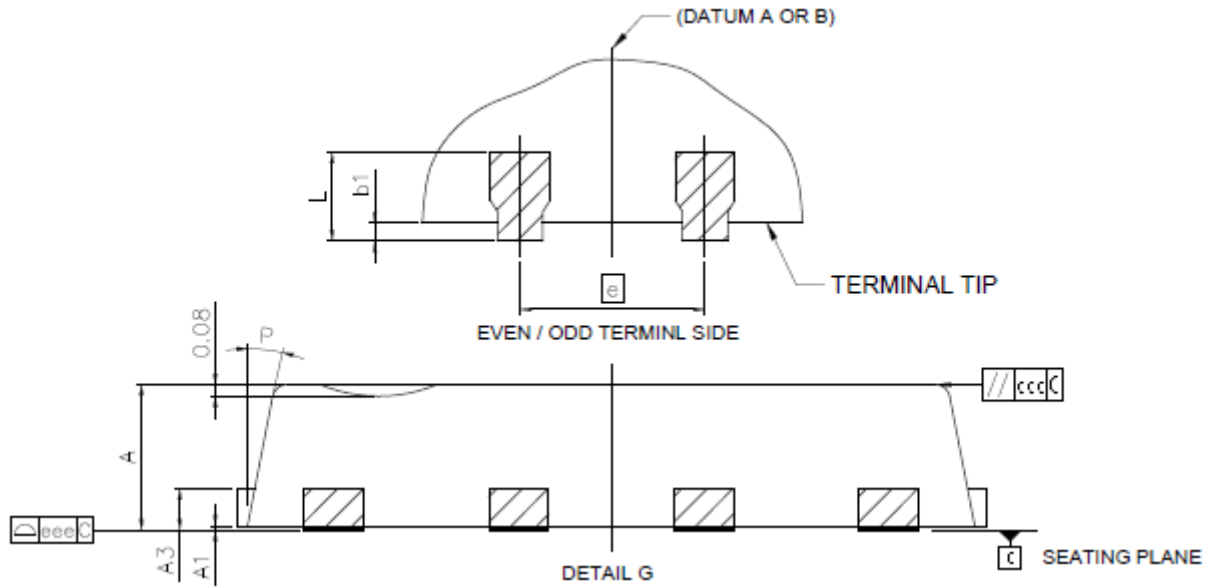
PDFN5x6 - 8L Package





## 8. Package Dimensions

PDFN5x6 - 8L Package



SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.95	1.05	aaa	0.10	
A1	0.00	0.05	bbb	0.10	
A3	0.25 REF		ccc	0.10	
b	0.31	0.51	ddd	0.05	
b1	0.03	0.13	eee	0.08	
b2	0.21	0.41			
D	5.15 BSC				
D1	5.00 BSC				
D2	3.70	3.90			
E	6.15 BSC				
E1	6.00 BSC				
E2	3.56	3.76			
e	1.27 BSC				
L	0.51	0.71			
M	0.51	0.71			
P	10°	12°			