

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Super Trench
- ☒ Advanced trench cell design

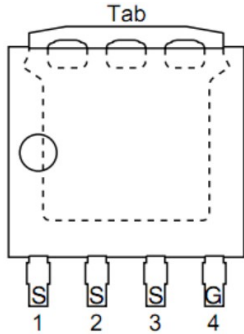
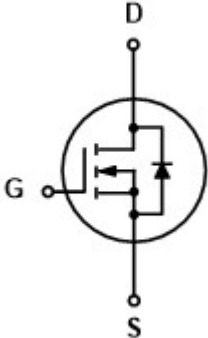
1.2 Applications

- ☒ BMS
- ☒ Drones
- ☒ High power inverter system
- ☒ Light electric vehicles

1.3 Quick reference

- ☒ $BV \geq 100\text{ V}$
- ☒ $P_{tot} \leq 260\text{ W}$
- ☒ $I_D \leq 45\text{ A}$
- ☒ $R_{DS(ON)} \leq 42\text{ m}\Omega @ V_{GS} = 10\text{ V}$
- ☒ $R_{DS(ON)} \leq 48\text{ m}\Omega @ V_{GS} = 4.5\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View LFPAK5*6	
4	Gate		
Tab	Drain		

3. Limiting Values

Symbol	Parameter		Rating	Unit
V _{DS}	Drain-Source Voltage		100	V
V _{GS}	Gate-Source Voltage		± 20	V
I _D	Drain Current	T _C = 25 °C	45	A
		T _C = 100 °C	32	A
I _{DM} ^{Note2}	Pulsed Source Current	T _C = 25 °C	90	A
I _S	Diode Forward Current	T _C = 25 °C	45	A
E _{AS}	Single Pulsed Avalanche Energy	L = 1.0mH	78	mJ
P _{tot}	Total Power Dissipation	T _C = 25 °C	260	W
R _{θJA} ^{Note1}	Thermal Resistance- Junction to Ambient		61	°C / W
R _{θJC}	Thermal Resistance- Junction to Case		0.57	°C / W
T _{stg}	Storage Temperature		-55~175	°C
T _J	Junction Temperature		175	°C

Note 1 : Surface Mounted on 1 in² pad area, $t \leq 10$ sec.

Note 2 : Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

Note 3 : Limited by bonding wire.

4. Marking Information

Product Name	Marking
UK380N10LF	380N10 YWW01 AAAAAA YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
UK380N10LF	LFPAK5*6			5000	

6. Electrical Characteristics ($T_A=25^\circ$ Unless Otherwise Noted)

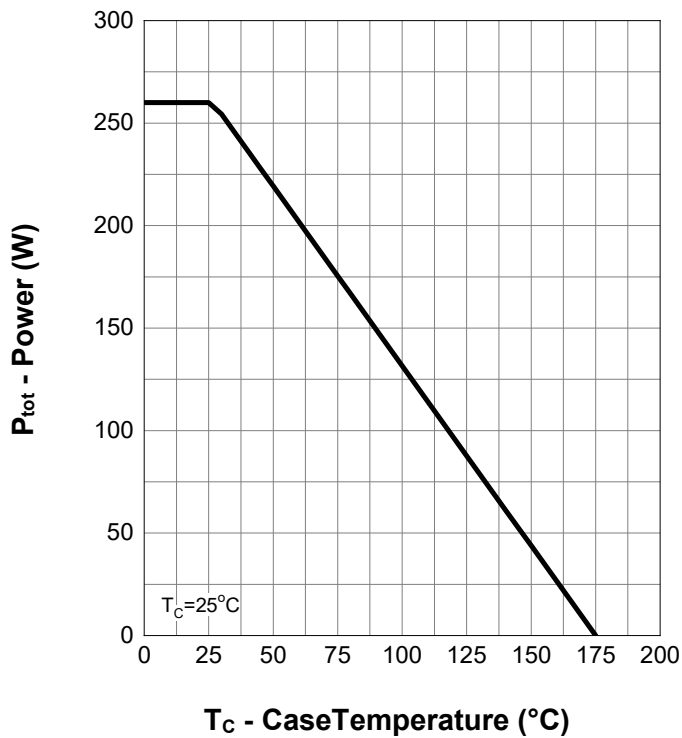
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _{DS} = 250 μA	100	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	1	-	2.5	V
I _{DSS}	Drain Leakage Current	V _{DS} = 80V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{DS} = 0 V, V _{GS} = ± 20 V	-	-	±100	nA
R _{DS(ON)} ^{Note1}	On-State Resistance	V _{GS} = 10 V, I _{DS} = 10 A	-	38	42	mΩ
		V _{GS} = 4.5V, I _{DS} = 5 A	-	41	48	
Diode Characteristics						
V _{SD} ^{Note1}	Diode Forward Voltage	I _{SD} =10 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{DS} = 10 A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	-	25	-	nS
Q _{rr}	Reverse Recovery Charge		-	30	-	nC
Dynamic Characteristics ^{Note2}						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 50 V Frequency = 1 MHz	-	2309	-	pF
C _{oss}	Output Capacitance		-	56	-	
C _{rss}	Reverse Transfer Capacitance		-	41	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 50 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L =5Ω, I _{DS} = 10 A	-	9	-	nS
t _r	Turn-on Rise Time		-	5	-	
t _{d(off)}	Turn-off Delay Time		-	33	-	
t _f	Turn-off Fall Time		-	9	-	
Gate Charge Characteristics ^{Note2}						
Q _g	Total Gate Charge	V _{DS} = 50 V, V _{GS} = 10 V, I _{DS} = 10A	-	45	-	nC
Q _{gs}	Gate-Source Charge		-	11	-	
Q _{gd}	Gate-Drain Charge		-	5	-	

Note 1: Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

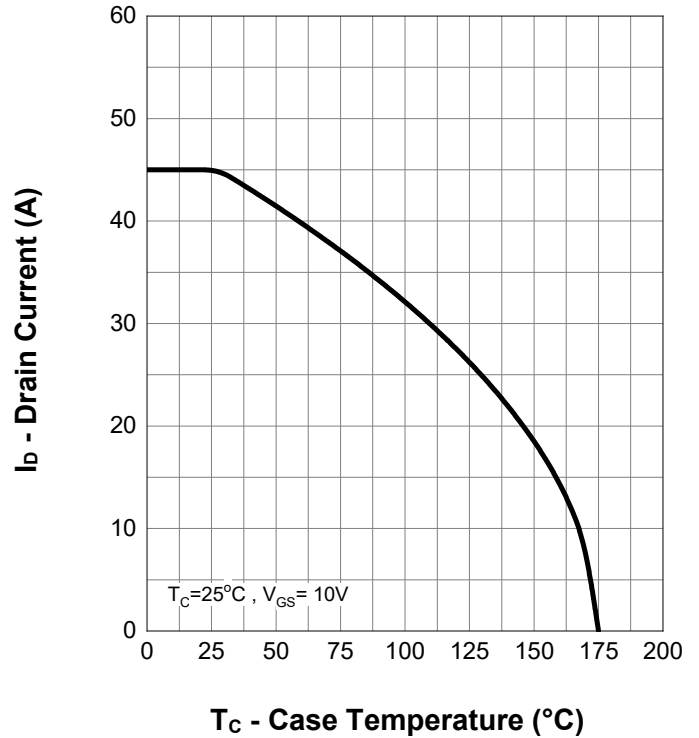
Note 2: Guaranteed by design, not subject to production testing.

7. Typical Characteristics

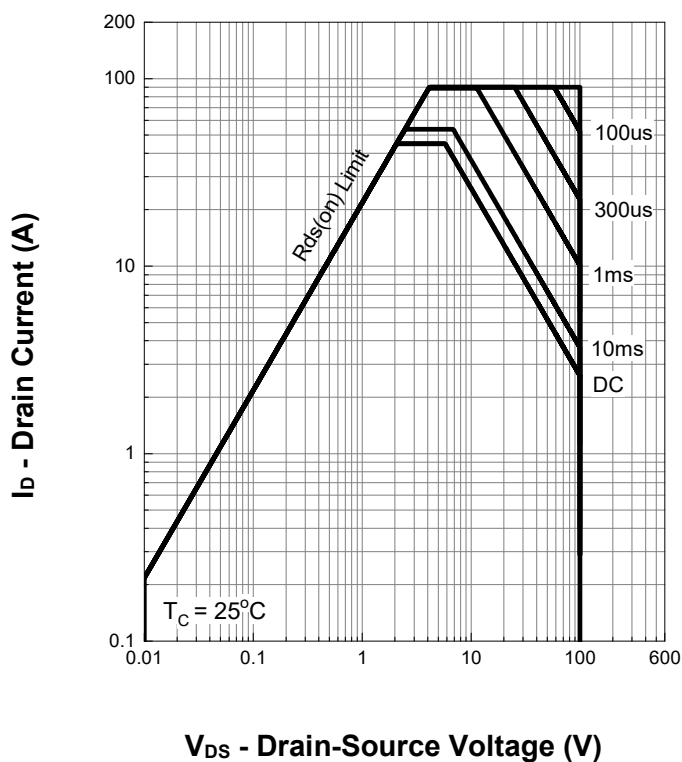
Power Capability



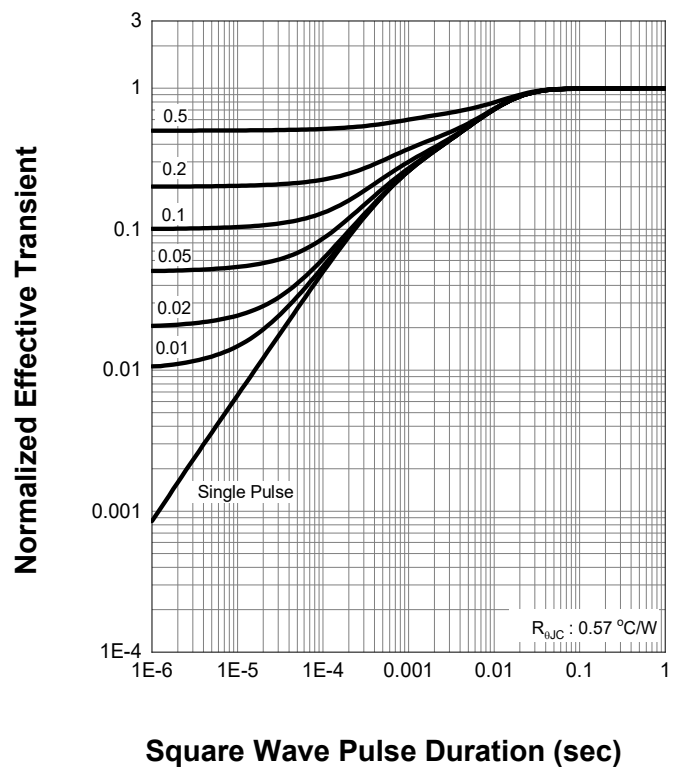
Current Capability



Safe Operating Area

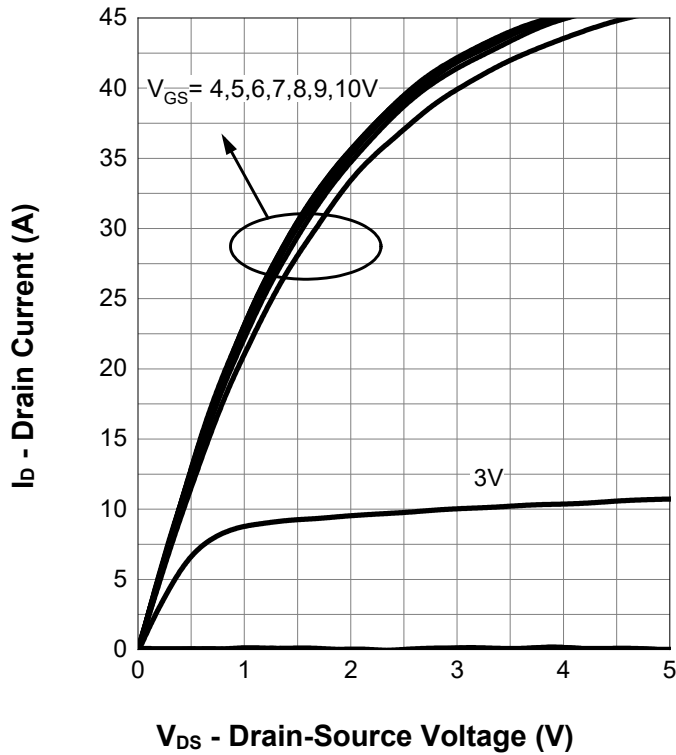


Transient Thermal Impedance

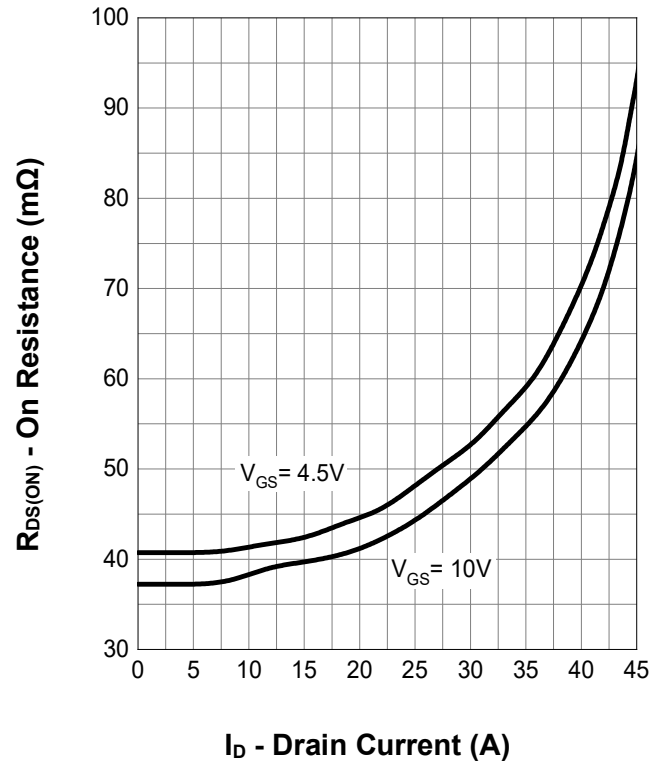


7. Typical Characteristics (cont.)

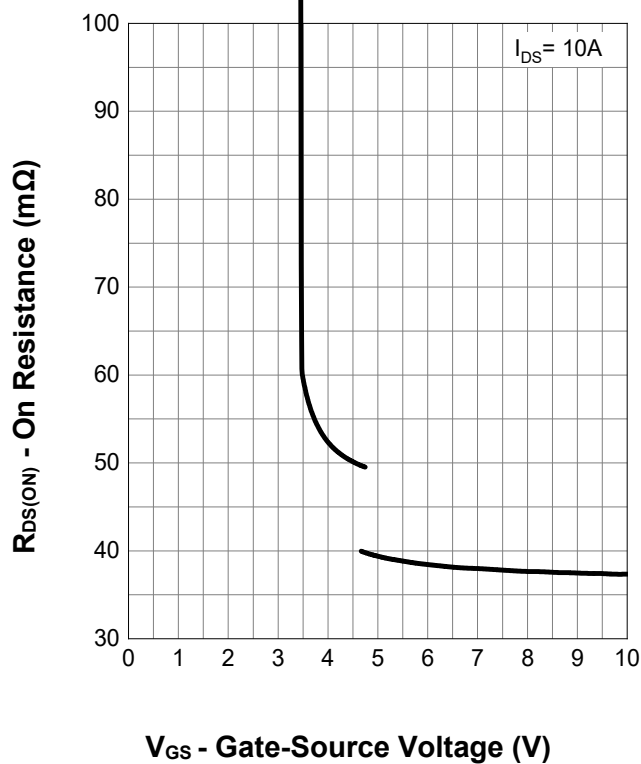
Output Characteristics



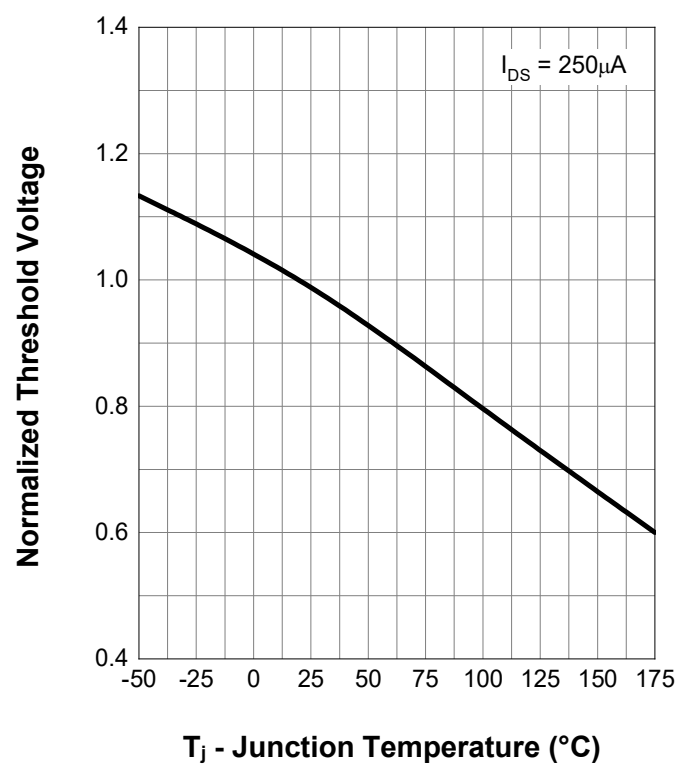
On Resistance



Transfer Characteristics

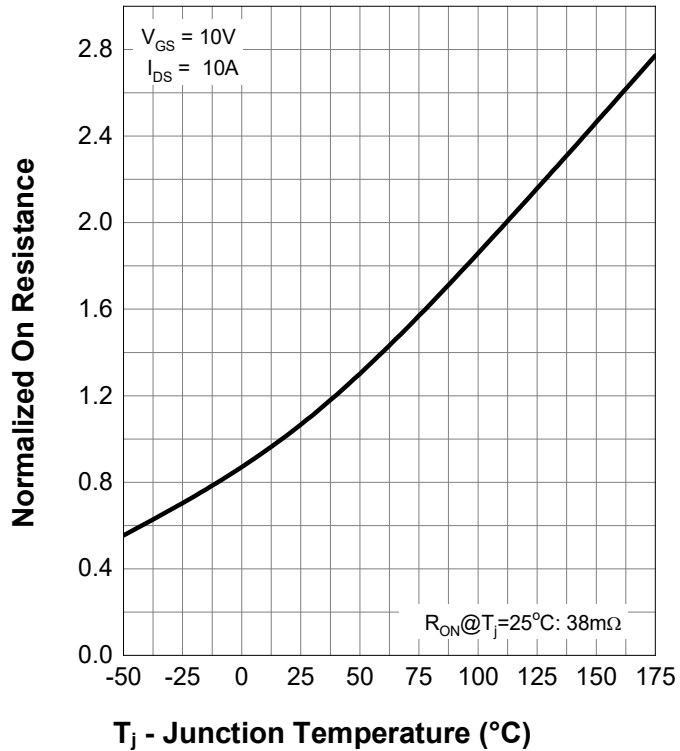


Normalized Threshold Voltage

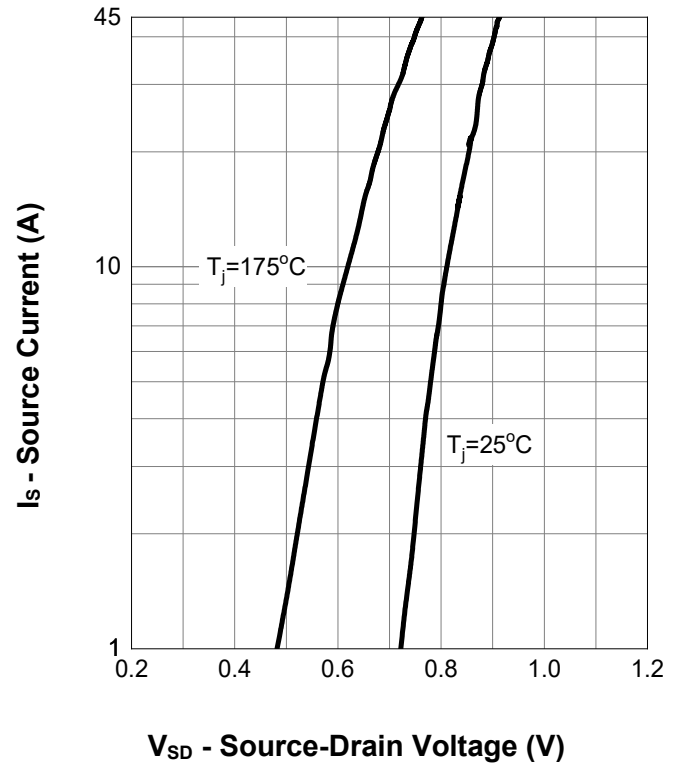


7. Typical Characteristics (cont.)

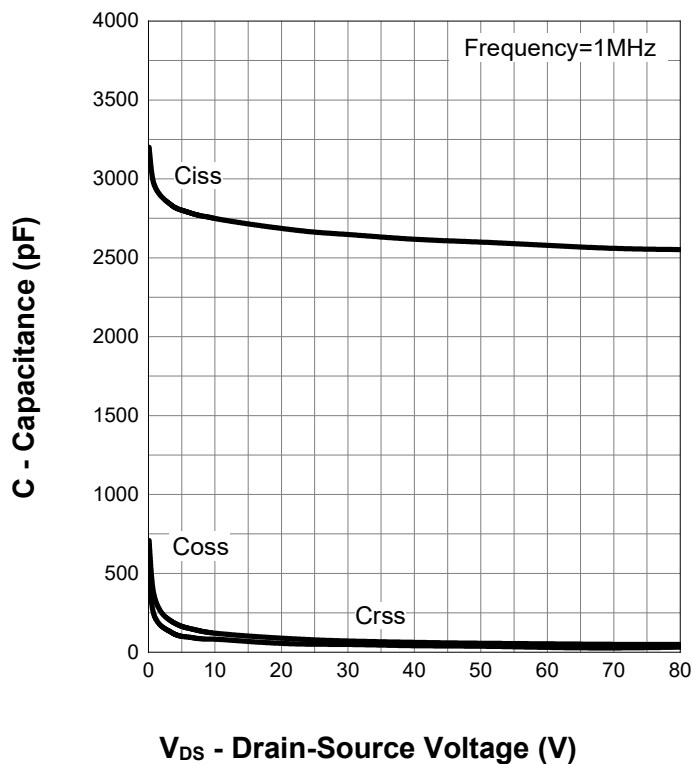
Normalized On Resistance



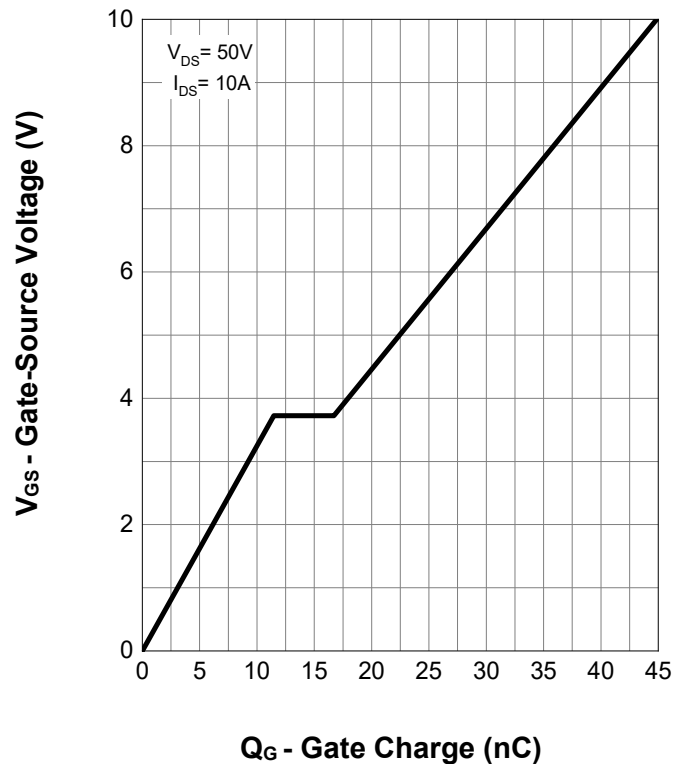
Diode Forward Current



Capacitance

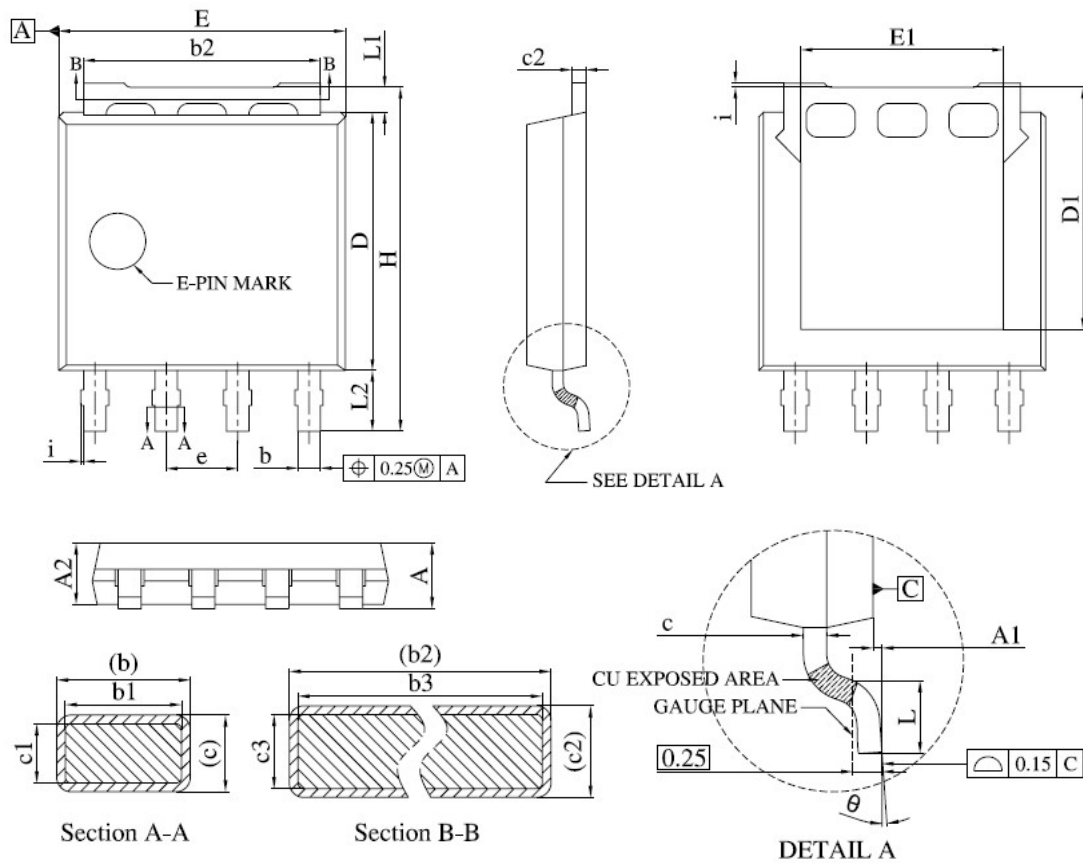


Gate Charge



8. Package Dimensions

LFPAK5*6 Package



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	1.00	1.30
A1	0.00	0.15
A2	0.98	1.12
b	0.35	0.50
b1	0.32	0.46
b2	4.02	4.41
b3	4.00	4.37
c	0.19	0.25
c1	0.17	0.23
c2	0.24	0.30
c3	0.22	0.28
D	4.45	4.70
D1	-	4.45
E	4.95	5.30
E1	3.50	3.70
e	1.27 BSC.	

Symbol	Dimensions In Millimeters	
	MIN.	MAX.
H	5.95	6.25
i	-	0.25
L	0.40	0.85
L1	0.27	0.57
L2	0.80	1.30
θ	0°	8°