P-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

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

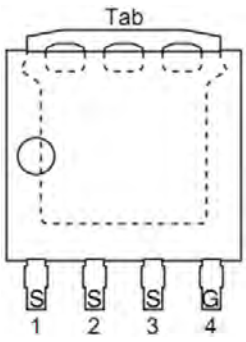
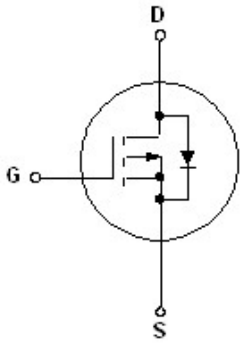
1.2 Applications

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

1.3 Quick reference

- ☑ BV ≧ -60 V
- ☑ P_{tot} ≦ 107 W
- ☑ I_D ≦ -40 A
- ☑ $R_{DS(ON)}$ ≦ 28mΩ @ V_{GS} = -10 V
- ☑ $R_{DS(ON)}$ ≦ 40mΩ @ V_{GS} = -4.5 V

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source		
4	Gate		
Tap	Drain		

Top View

LFPAK5*6

3. Limiting Values

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-Source Voltage		-60	V
V_{GS}	Gate-Source Voltage		± 20	V
I_D	Drain Current	T_C = 25 ℃	-40	A
		T_C = 100 ℃	-28	A
I_{DM} Note2	Pulsed Source Current	T_C = 25 ℃	-70	A
I_S	Diode Forward Current	T_C = 25 ℃	-40	A
E_{AS}	Single Pulsed Avalanche Energy	L= 1.0mH	128	mJ
P_{tot}	Total Power Dissipation	T_C = 25 ℃	107	W
$R_{\theta JA}$ Note1	Thermal Resistance- Junction to Ambient		62	℃ / W
$R_{\theta JC}$	Thermal Resistance- Junction to Case		1.4	℃ / W
T_{stg}	Storage Temperature		-55~175	℃
T_J	Junction Temperature		175	℃

Note 1：Surface Mounted on 1 in^2 pad area, t ≤ 10 sec.
Note 2：Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note 3：Limited by bonding wire.

4. Marking Information

Product Name	Marking
UK250P06LF	250P06 YWW01 AAAAAA YWWXXX: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
UK250P06LF	LFPAK5*6			5000	

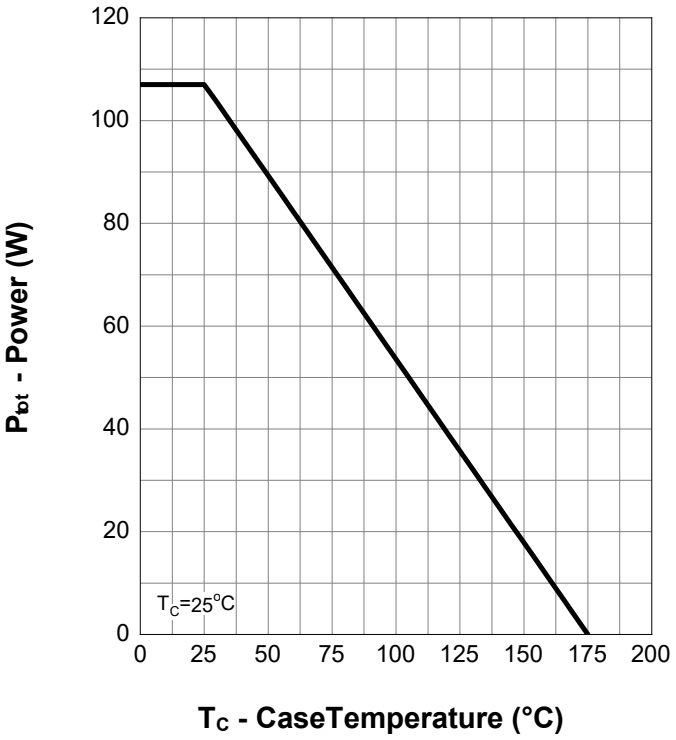
6. Electrical Characteristics (T_A=25 ° Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = -250 μA	-60	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = -250 μA	-1	-	-2	V
I_{DSS}	Drain Leakage Current	V_{DS} = -48V, 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	-	25	28	mΩ
		V_{GS} = -4.5V, I_{DS} = -5A	-	35	40	
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	-	19	-	nS
Q_{rr}	Reverse Recovery Charge		-	16	-	nC
Dynamic Characteristics[Note2]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = -30 V Frequency = 1 MHz	-	2240	-	pF
C_{oss}	Output Capacitance		-	113	-	
C_{rss}	Reverse Transfer Capacitance		-	85	-	
t_{d}(on)	Turn-on Delay Time	V_{DS} = -30 V, V_{GEN} = -10 V, R_G = 3.9 Ω, R_L =3Ω, I_{DS} = -10 A	-	7	-	nS
t_r	Turn-on Rise Time		-	15	-	
t_{d}(off)	Turn-off Delay Time		-	63	-	
t_f	Turn-off Fall Time		-	26	-	
Gate Charge Characteristics [Note2]						
Q_g	Total Gate Charge	V_{DS} = -30 V, V_{GS} = -10 V, I_{DS} = -10A	-	47	-	nC
Q_{gs}	Gate-Source Charge		-	11	-	
Q_{gd}	Gate-Drain Charge		-	6	-	

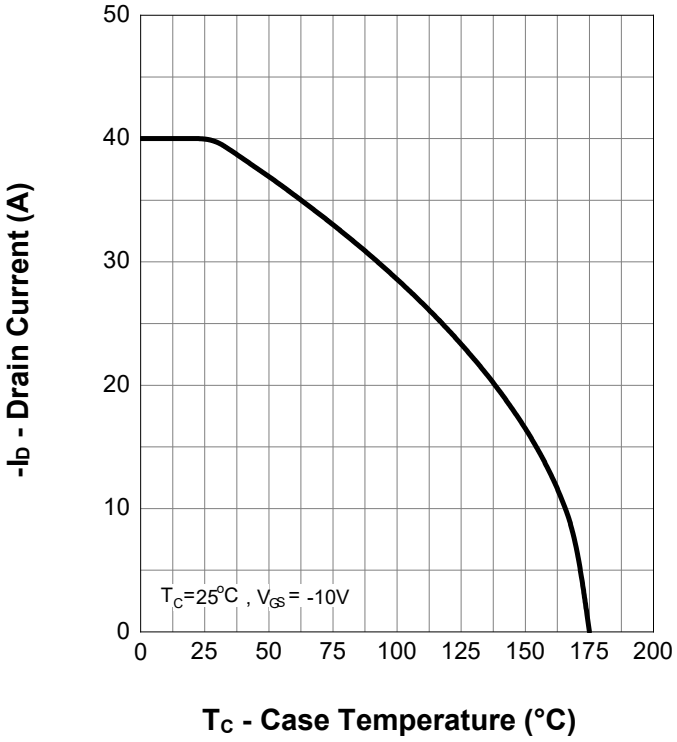
Note 1: Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note 2: Guaranteed by design, not subject to production testing.

7. Typical Characteristics

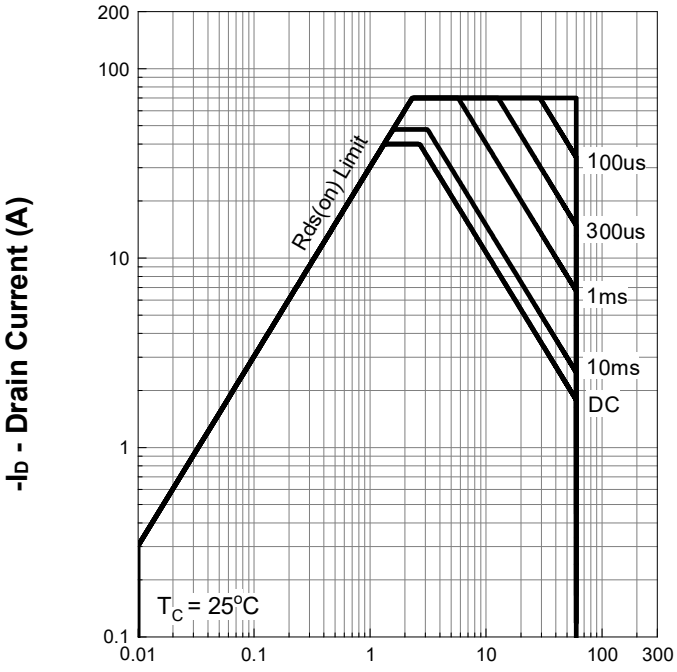
Power Capability



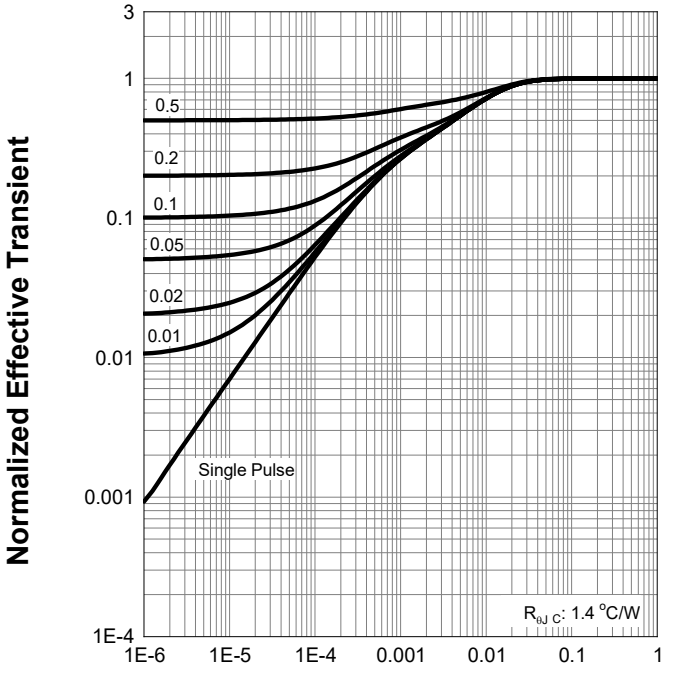
Current Capability



Safe Operating Area

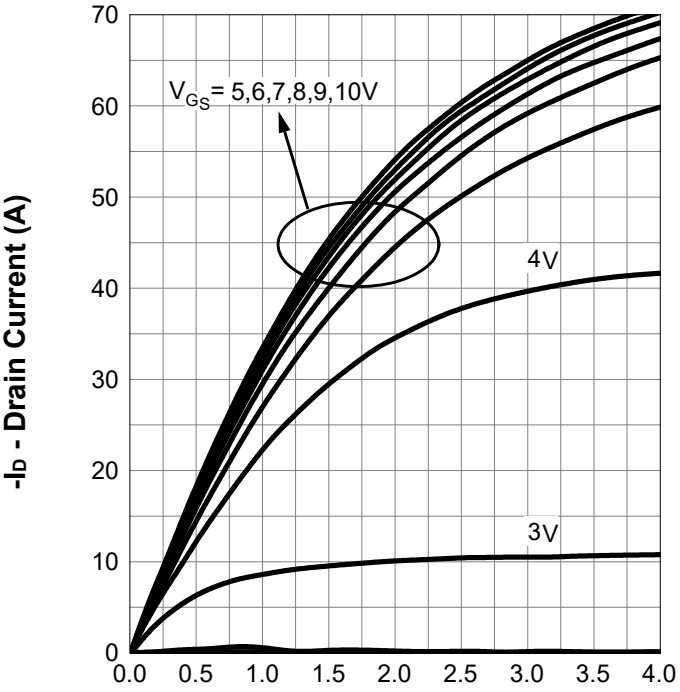


Transient Thermal Impedance

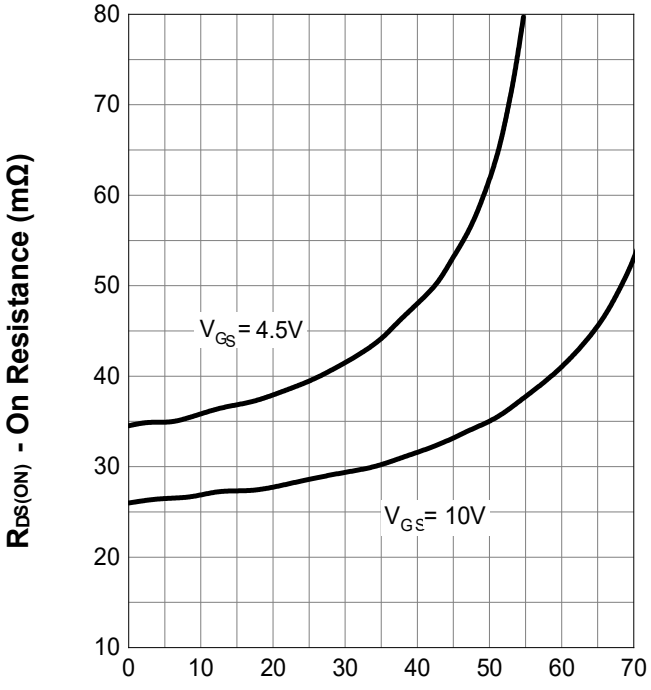


7. Typical Characteristics (cont.)

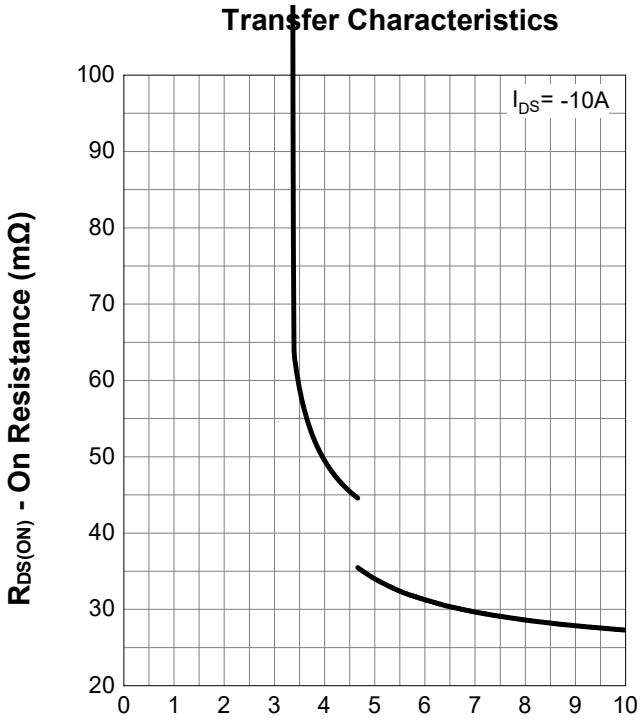
Output Characteristics



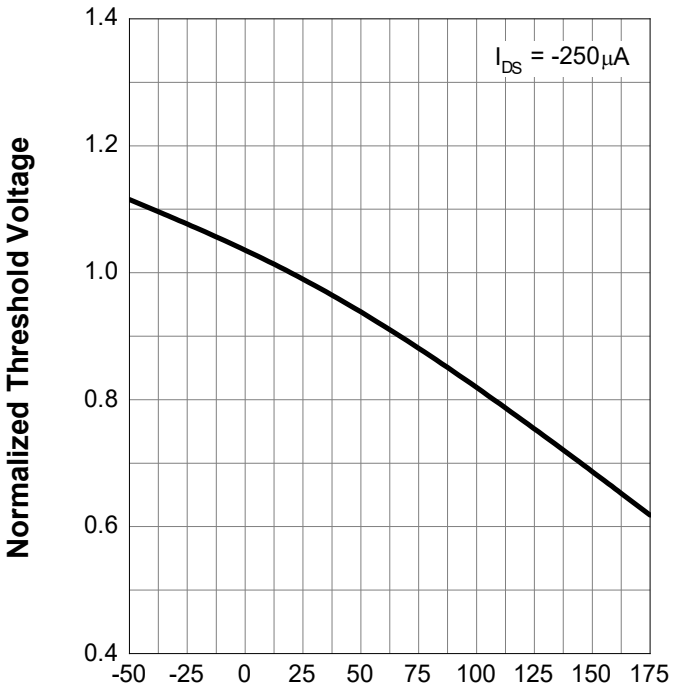
On Resistance



Transfer Characteristics

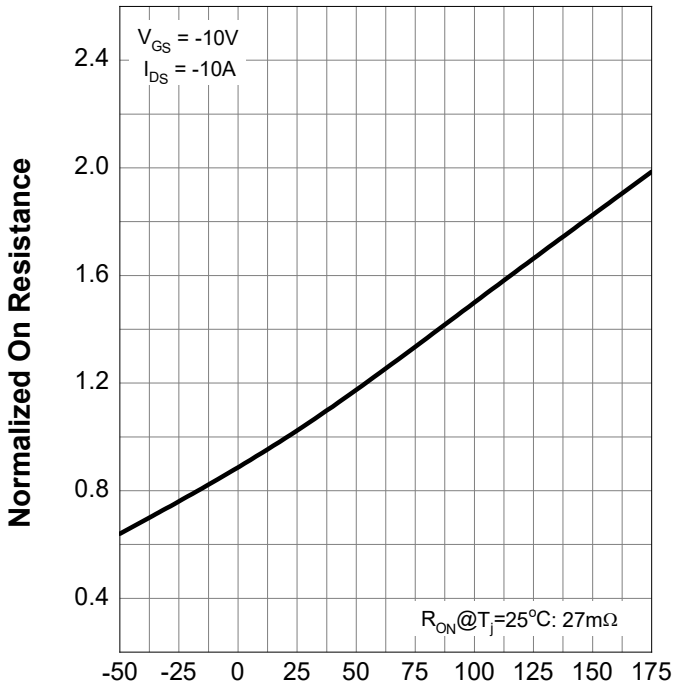


Normalized Threshold Voltage



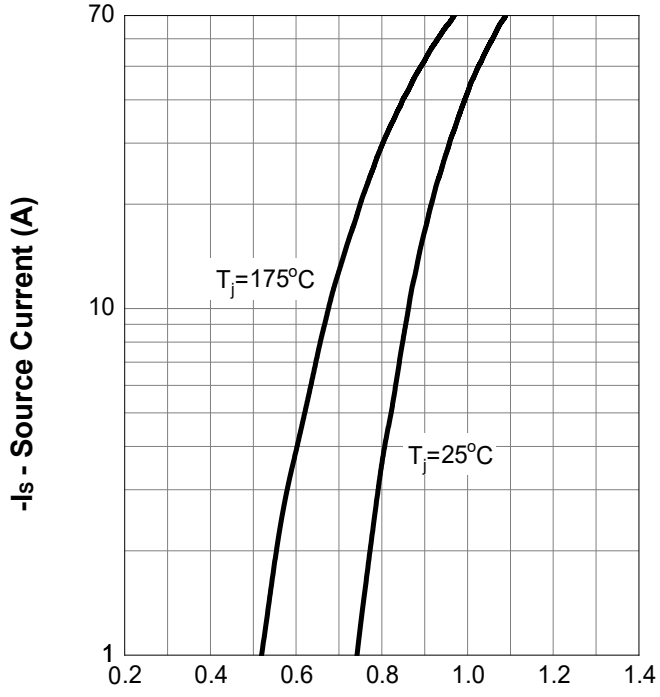
7. Typical Characteristics (cont.)

Normalized On Resistance



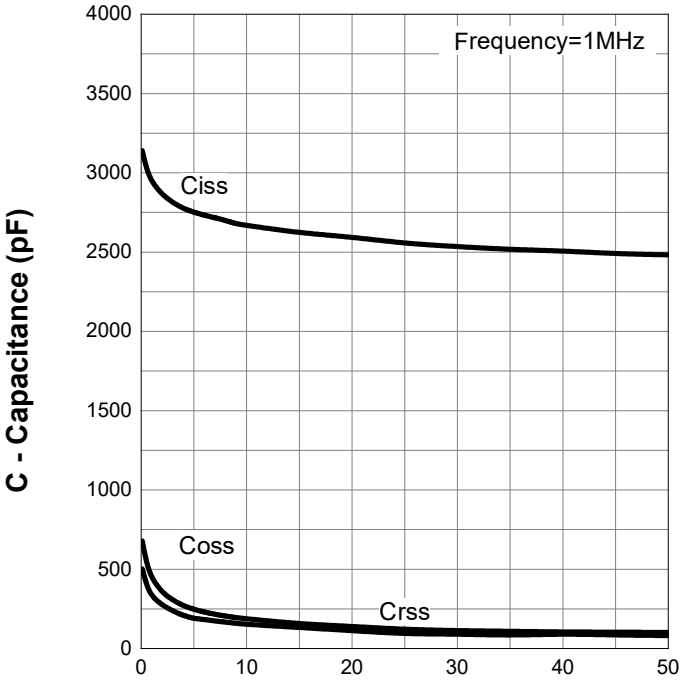
T_j - Junction Temperature (°C)

Diode Forward Current



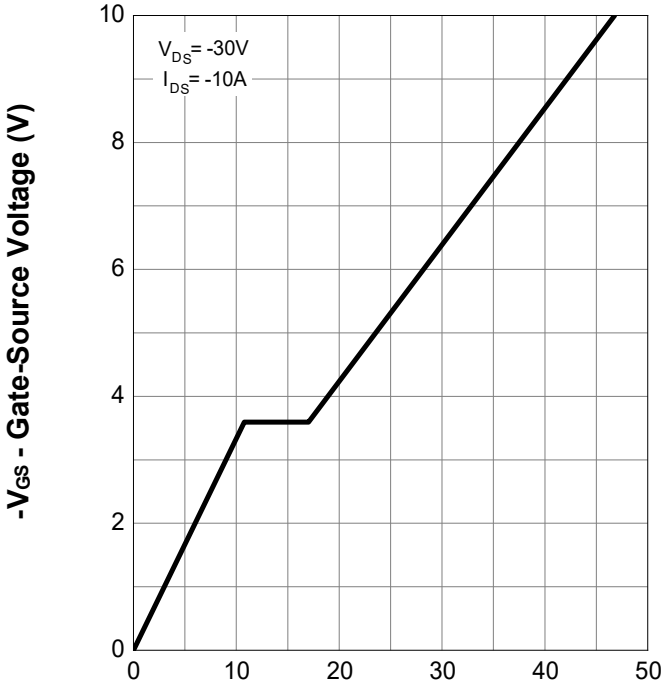
$-V_{SD}$ - Source-Drain Voltage (V)

Capacitance



$-V_{DS}$ - Drain-Source Voltage (V)

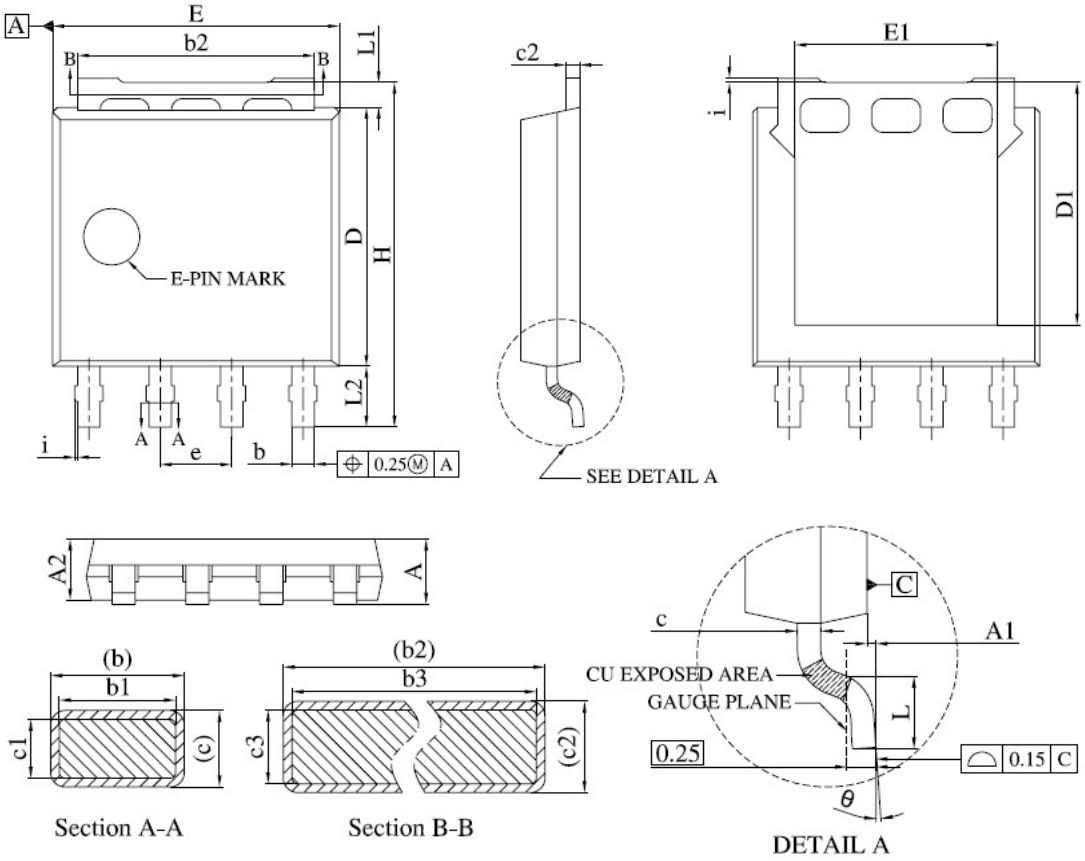
Gate Charge



Q_G - Gate Charge (nC)

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°