

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low Thermal Resistance

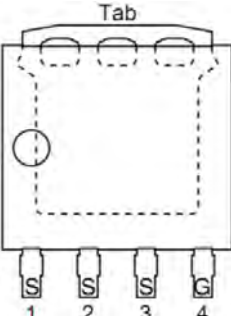
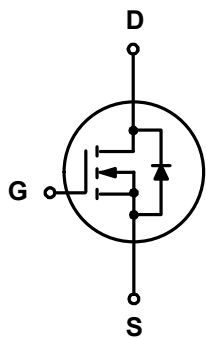
1.2 Applications

- ☒ Motor drivers
- ☒ DC - DC Converter

1.3 Quick reference

- ☒ $BV \geq 40 \text{ V}$
- ☒ $P_{tot} \leq 300 \text{ W}$
- ☒ $I_D \leq 300 \text{ A}$
- ☒ $R_{DS(ON)} \leq 1.1 \text{ m}\Omega @ V_{GS} = 10 \text{ V}$
- ☒ $R_{DS(ON)} \leq 2.9 \text{ m}\Omega @ V_{GS} = 6 \text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 Top View LFPAK	
4	Gate		
5	Drain		

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V _{DS}	Drain-Source Voltage	T _C = 25 °C	-	40	V
V _{GS}	Gate-Source Voltage	T _C = 25 °C	-	± 20	V
I _D ^{*,***}	Drain Current	T _C = 25 °C, V _{GS} = 10 V	-	300	A
		T _C = 100 °C, V _{GS} = 10 V	-	278	A
I _{DM} ^{*,**}	Pulsed Source Current	T _C = 25 °C, V _{GS} = 10 V	-	1200	A
P _{tot}	Total Power Dissipation	T _C = 25 °C	-	300	W
T _{stg}	Storage Temperature		- 55	175	°C
T _J	Junction Temperature		-	175	°C
I _S	Diode Forward Current	T _C = 25 °C	-	300	A
E _{AS} [*]	Single Pulsed Avalanche Energy	V _{DD} = 40 V , L = 1.0 mH	-	1436	mJ
R _{θJA} [*]	Thermal Resistance- Junction to Ambient		-	65	°C / W
R _{θJC}	Thermal Resistance- Junction to Case		-	0.5	

Notes :

- * Surface Mounted on 1 in² pad area, t ≤ 10 sec
- ** Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- *** Limited by bonding wire

4. Marking Information

Product Name	Marking
UK010N04LFH	010N04H YWW01 AAAAAA YWW01: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
UK010N04LFH	LFPK5*6	-	-	5000	

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	40	-	-	V
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _{DS} = 250 μA	2	-	4	V
I _{DSS}	Drain Leakage Current	V _{DS} = 32 V, V _{GS} = 0 V	-	-	1	μA
I _{GSS}	Gate Leakage Current	V _{GS} = 0 V, V _{GS} = ± 20 V	-	-	±100	nA
R _{DS(ON)} ^a	On-State Resistance	V _{GS} = 10 V, I _{DS} = 30 A	-	0.96	1.1	mΩ
		V _{GS} = 6 V, I _{DS} = 20 A	-	2.2	2.9	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 30 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{DS} = 30 A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	-	34	-	nS
Q _{rr}	Reverse Recovery Charge		-	25	-	nC
Dynamic Characteristics ^b						
C _{iSS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 20 V Frequency = 1 MHz	-	14272	-	pF
C _{oSS}	Output Capacitance		-	916	-	
C _{rSS}	Reverse Transfer Capacitance		-	280	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 20 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 0.66 Ω, I _{DS} = 30 A	-	44	-	nS
t _r	Turn-on Rise Time		-	87	-	
t _{d(off)}	Turn-off Delay Time		-	113	-	
t _f	Turn-off Fall Time		-	55	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = 20 V, V _{GS} = 10 V, I _{DS} = 30 A	-	217	-	nC
Q _{gs}	Gate-Source Charge		-	84	-	
Q _{gd}	Gate-Drain Charge		-	36	-	

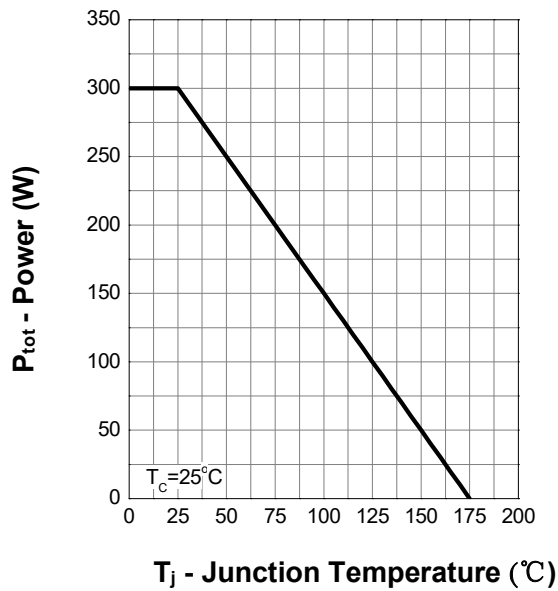
Notes :

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

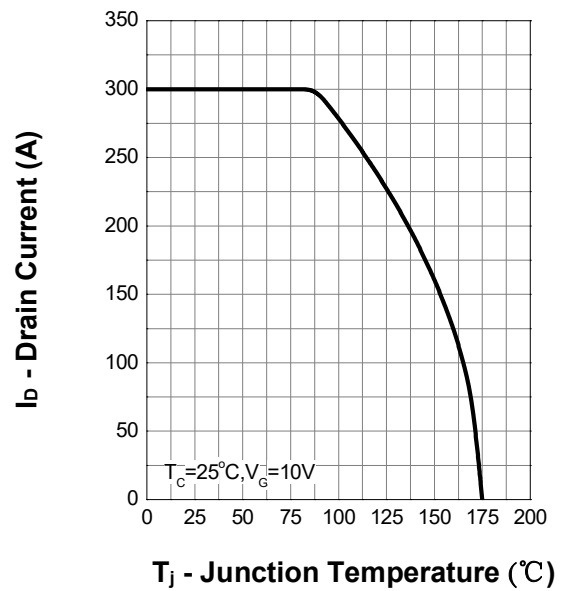
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

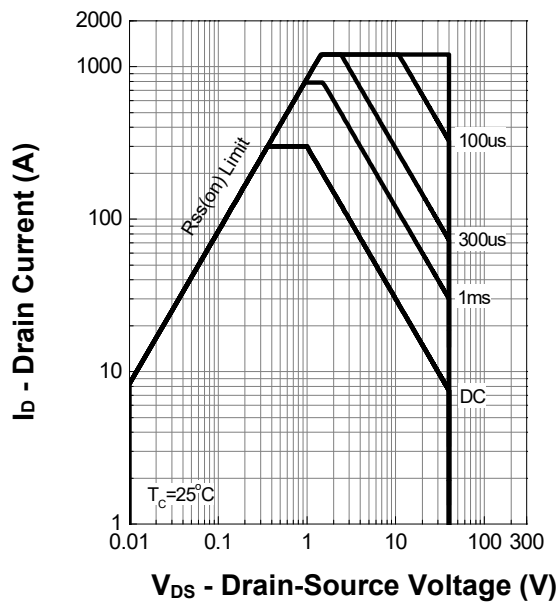
Power Capability



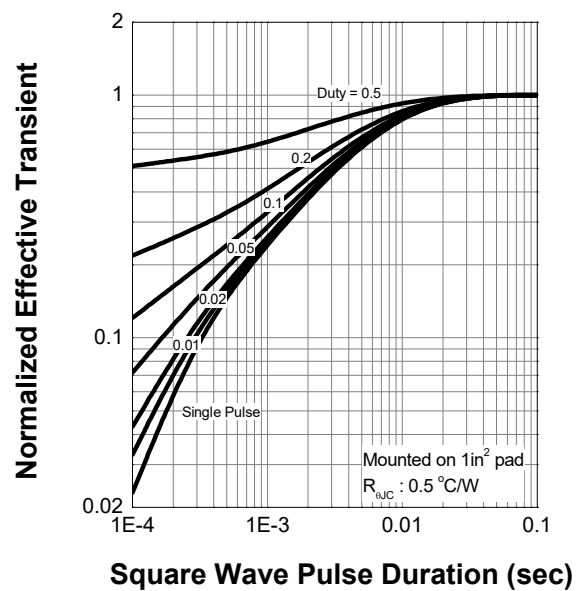
Current Capability



Safe Operation Area

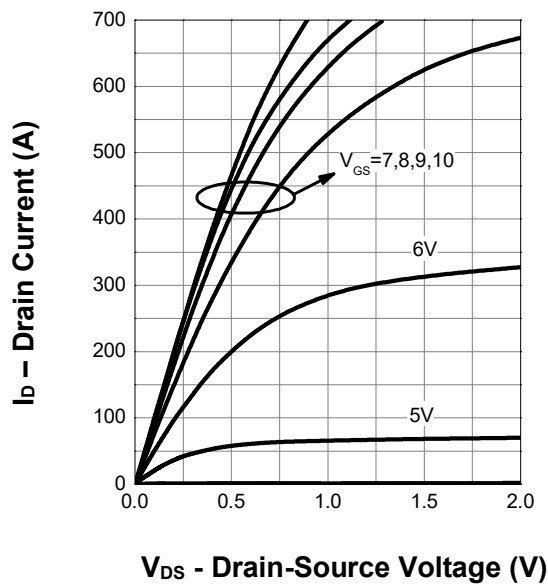


Thermal Transient Impedance

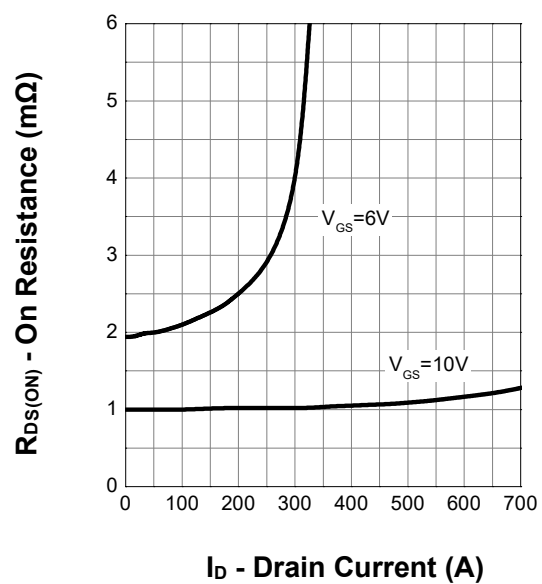


7. Typical Characteristics (cont.)

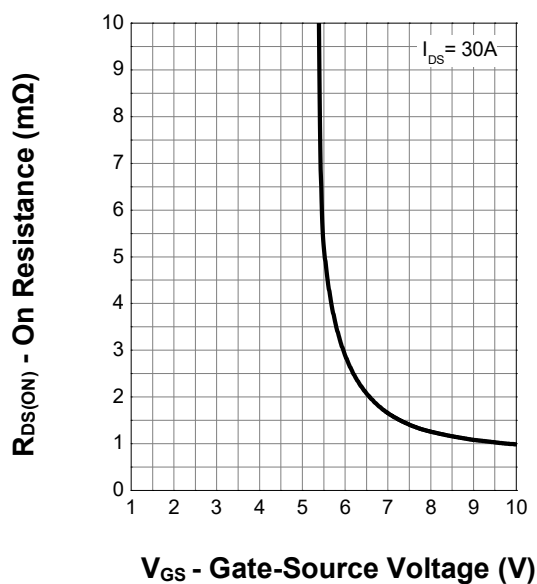
Output Characteristics



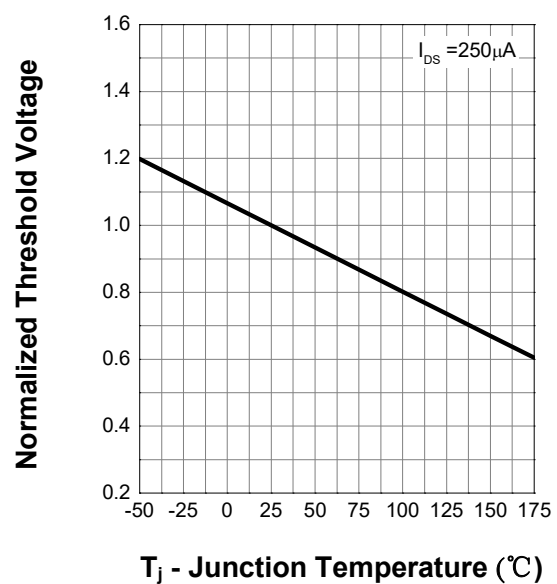
Drain-Source On Resistance



Transfer Characteristics

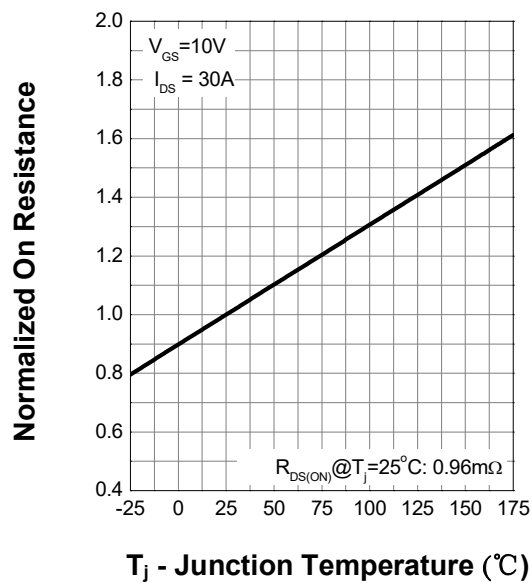


Gate Threshold Voltage

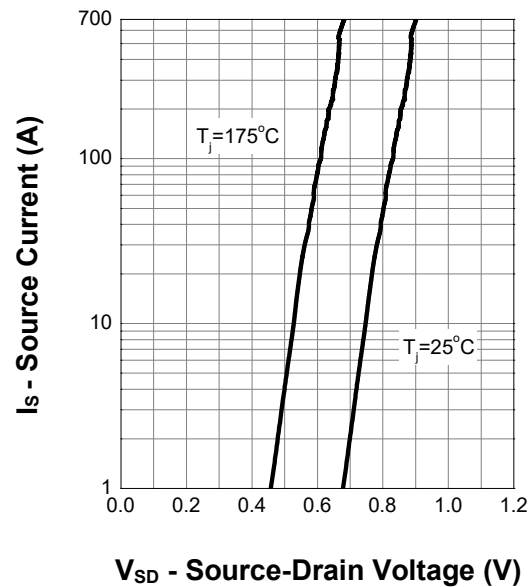


7. Typical Characteristics (cont.)

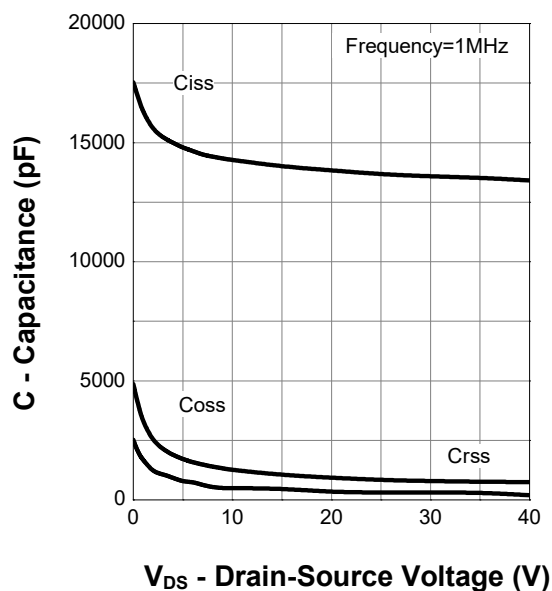
Drain-Source On Resistance



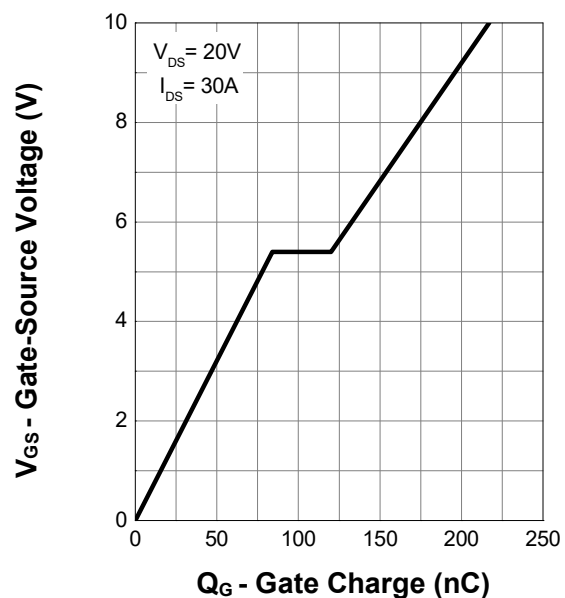
Body Diode Characteristics



Capacitance

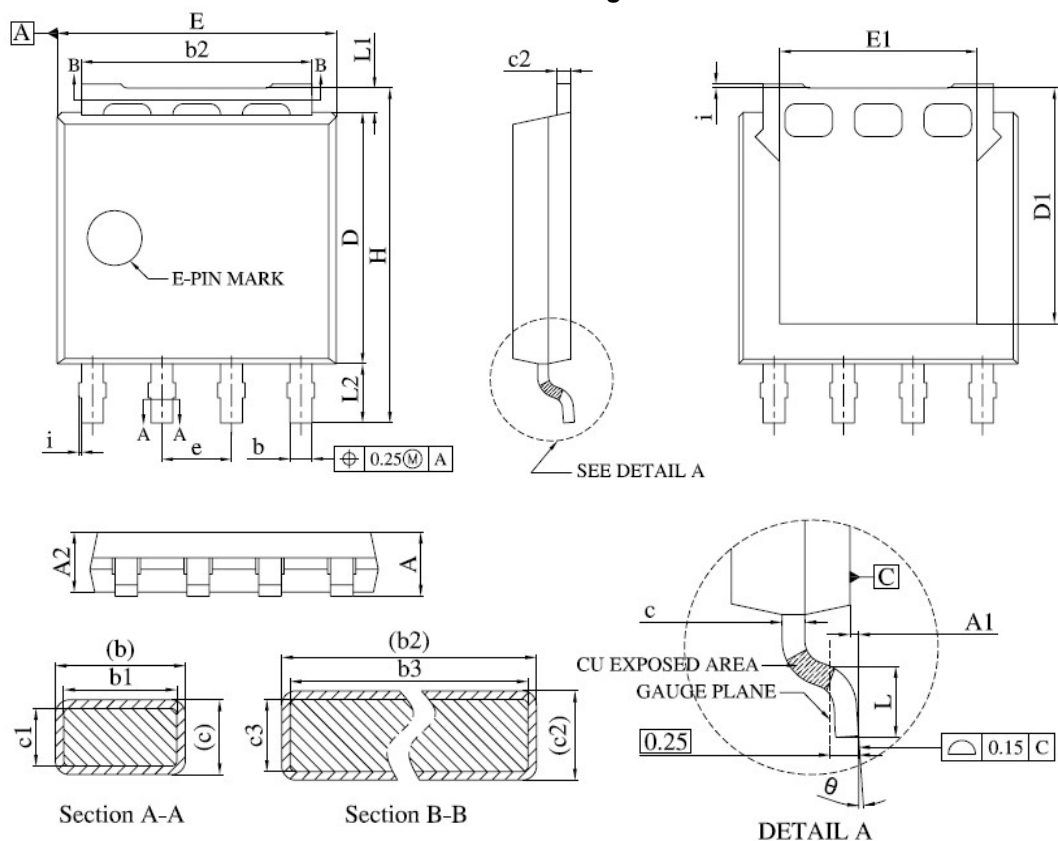


Gate Charge



8. Package Dimensions

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°