

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ☒ Surface-mounted package
- ☒ Low Thermal Resistance

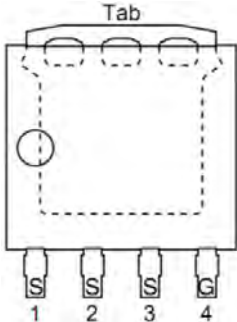
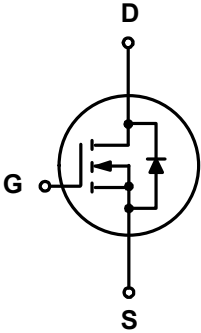
1.2 Applications

- ☒ Motor drivers
- ☒ DC - DC Converter

1.3 Quick reference

- ☒ $BV \geq 30 \text{ V}$
- ☒ $P_{tot} \leq 300 \text{ W}$
- ☒ $I_D \leq 300 \text{ A}$
- ☒ $R_{DS(ON)} \leq 0.55 \text{ m}\Omega @ V_{GS} = 10 \text{ V}$
- ☒ $R_{DS(ON)} \leq 0.95 \text{ m}\Omega @ V_{GS} = 4.5 \text{ V}$

2. Pin Description

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

3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-	30	V
V_{GS}	Gate-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-	± 20	V
$I_D^{*,***}$	Drain Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	300	A
		$T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	300	A
$I_{DM}^{*,**}$	Pulsed Source Current	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	1200	A
P_{tot}^*	Total Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	-	375	W
T_{stg}	Storage Temperature		- 55	175	$^{\circ}\text{C}$
T_J	Junction Temperature		-	175	$^{\circ}\text{C}$
I_S	Diode Forward Current	$T_C = 25\text{ }^{\circ}\text{C}$	-	300	A
E_{AS}^*	Single Pulsed Avalanche Energy	$V_{DD} = 30\text{ V}, L = 1\text{ mH}$	-	1624	mJ
$R_{\theta JA}^*$	Thermal Resistance- Junction to Ambient		-	60	$^{\circ}\text{C} / \text{W}$
$R_{\theta JC}^*$	Thermal Resistance- Junction to Case		-	0.5	

Notes :

- * Surface Mounted on 1 in² pad area, $t \leq 10\text{ sec}$
- ** Pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- *** Limited by bonding wire

4. Marking Information

Product Name	Marking
UK006N03LF	006N03 YWW01 AAAAAA YWW01: Date Code

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
UK006N03LF	LFPAK5*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	30	-	-	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} = 24 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} = 50 A	-	0.48	0.55	mΩ
		V _{GS} = 4.5 V, I _{DS} = 30 A	-	0.82	0.95	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} = 50 A, V _{GS} = 0 V	-	-	1.3	V
t _{rr}	Reverse Recovery Time	I _{DS} = 40 A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	-	26	-	nS
Q _{rr}	Reverse Recovery Charge		-	18	-	nC
Dynamic Characteristics ^b						
C _{iSS}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 15 V Frequency = 1 MHz	-	17195	-	pF
C _{oSS}	Output Capacitance		-	1425	-	
C _{rSS}	Reverse Transfer Capacitance		-	600	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 15 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 0.3 Ω, I _{DS} = 50 A	-	23	-	nS
t _r	Turn-on Rise Time		-	151	-	
t _{d(off)}	Turn-off Delay Time		-	249	-	
t _f	Turn-off Fall Time		-	127	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = 15 V, V _{GS} = 10 V, I _{DS} = 50 A	-	306	-	nC
Q _{gs}	Gate-Source Charge		-	63	-	
Q _{gd}	Gate-Drain Charge		-	44	-	

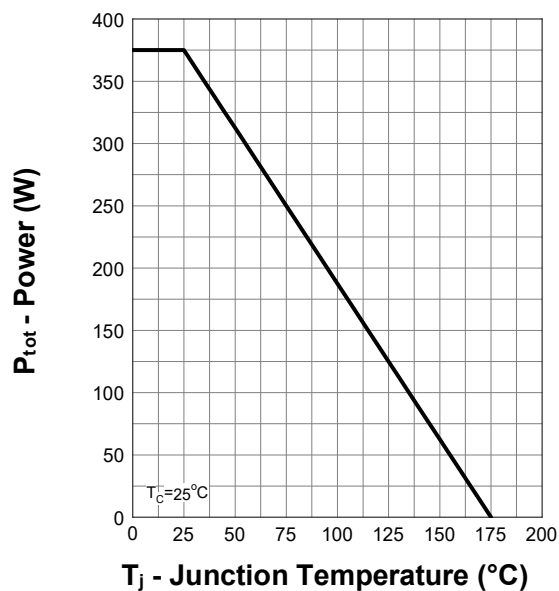
Notes :

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

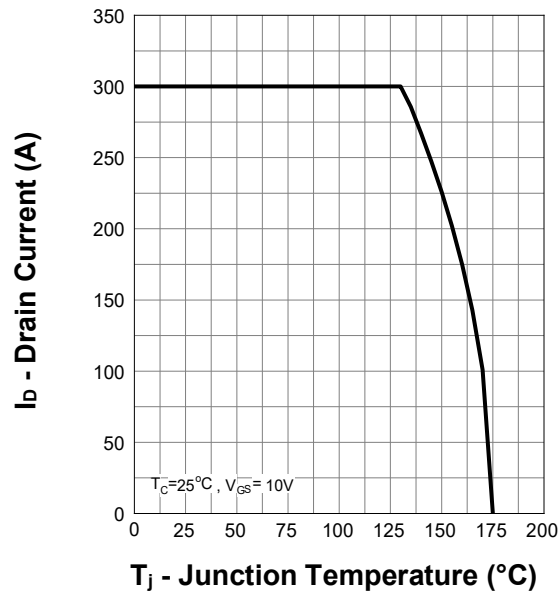
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

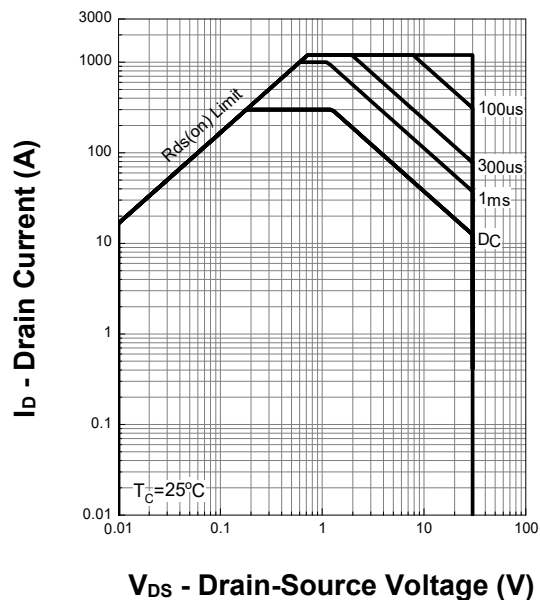
Power Capability



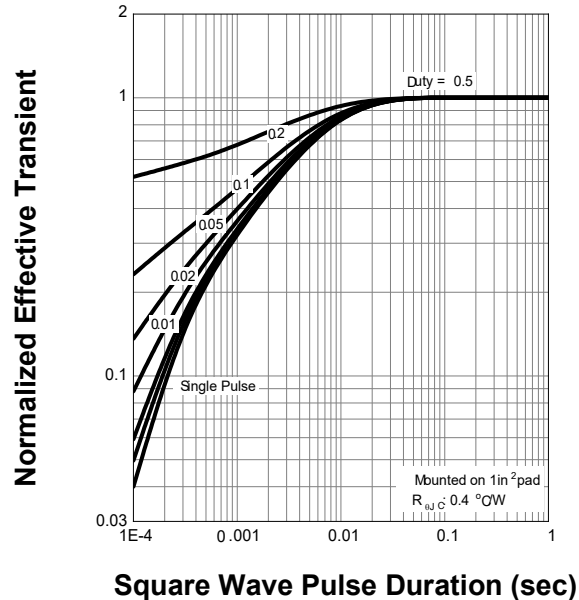
Current Capability



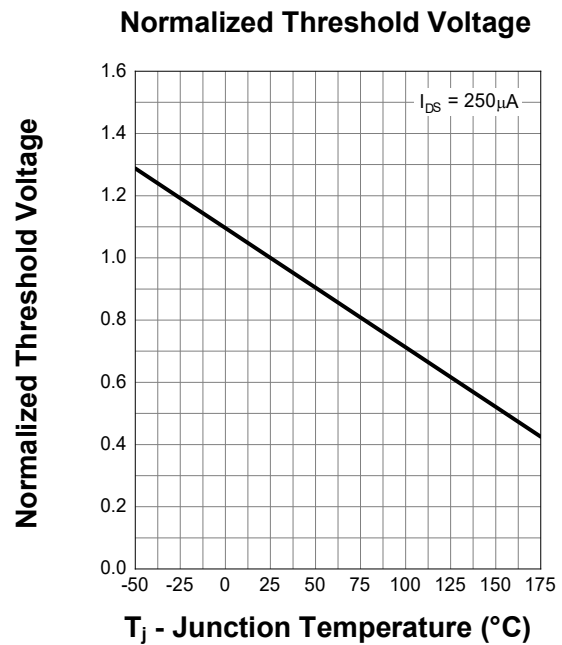
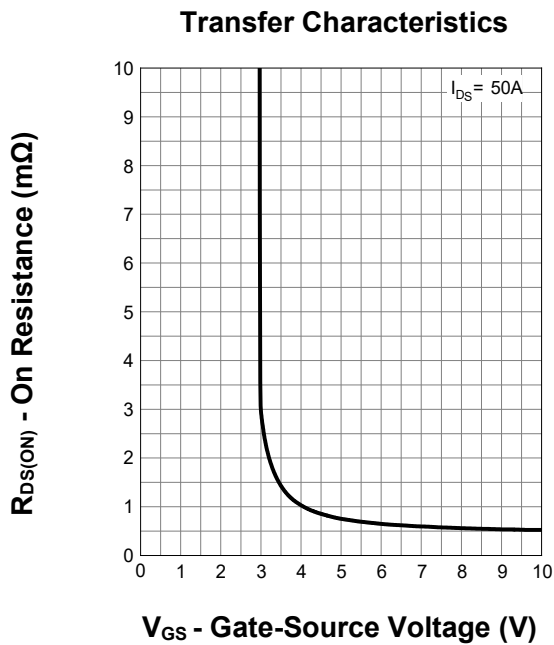
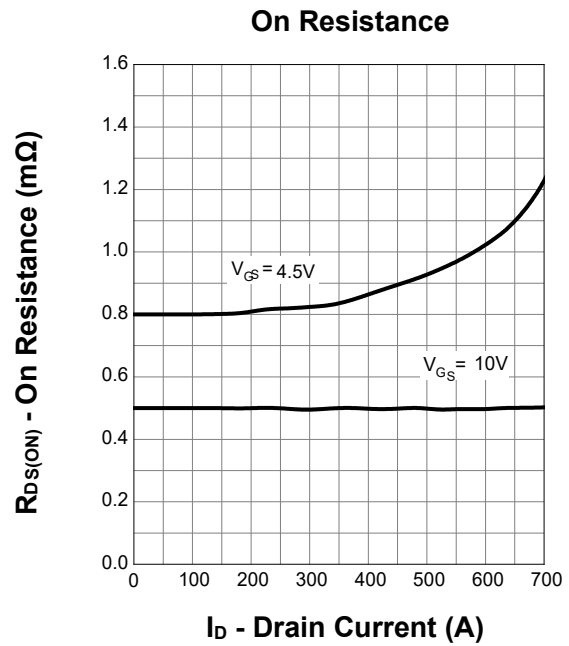
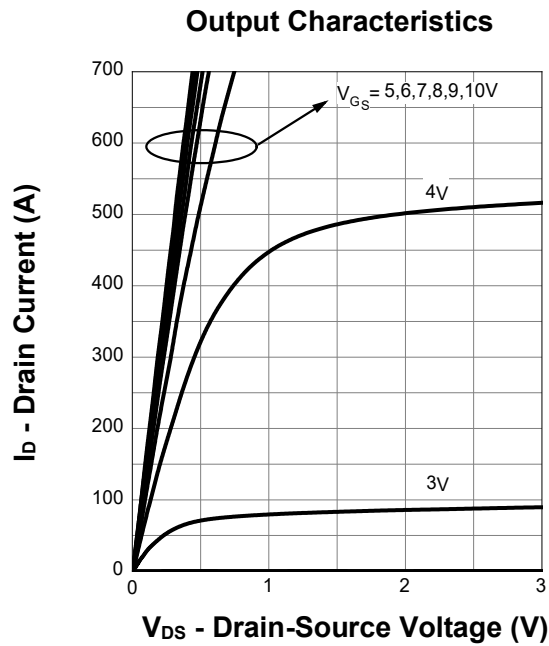
Safe Operating Area



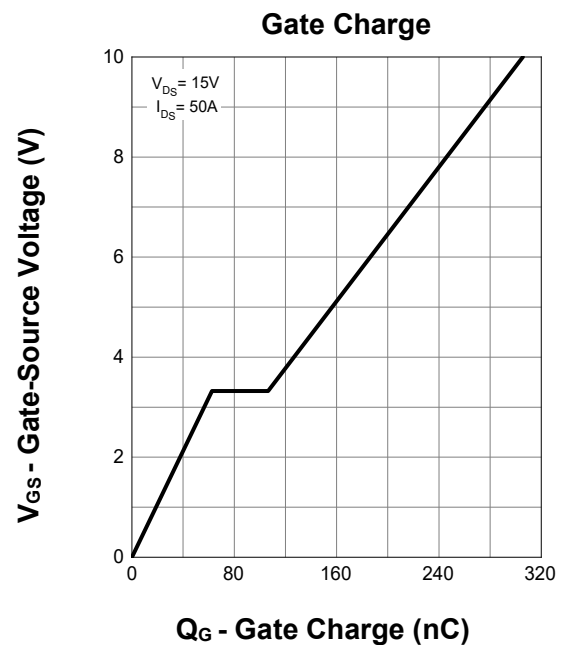
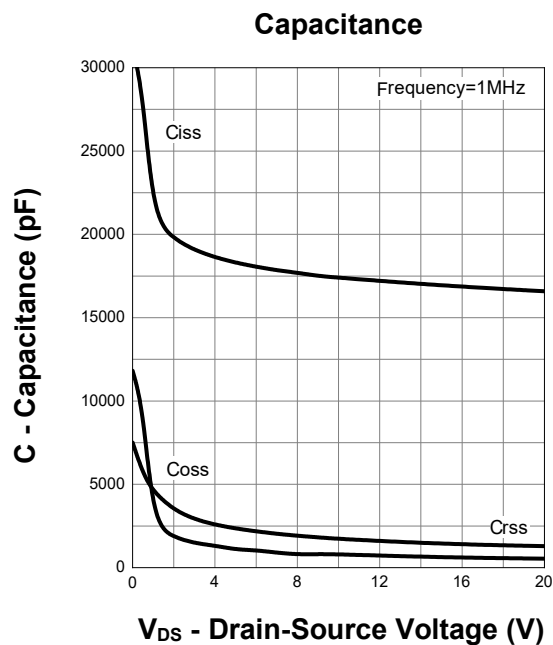
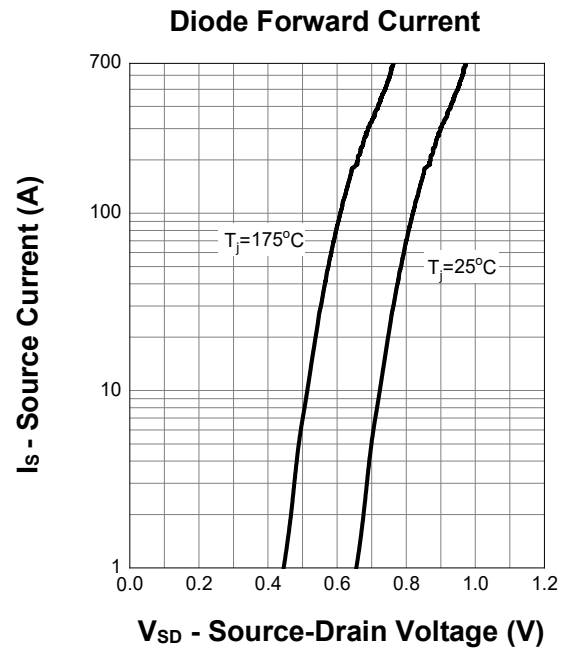
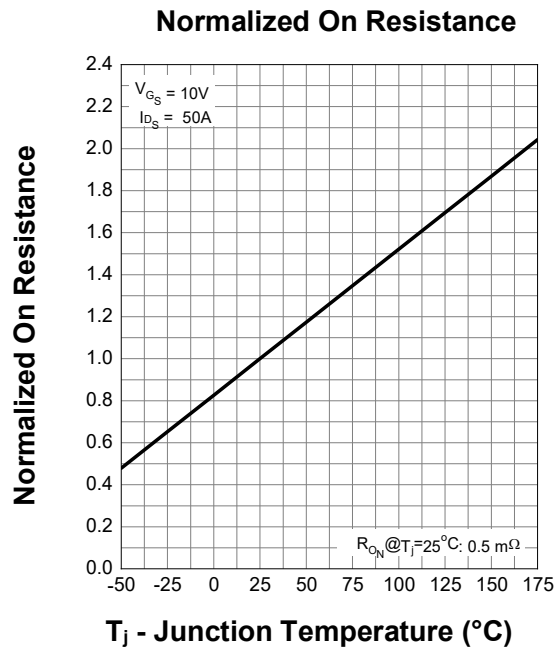
Transient Thermal Impedance



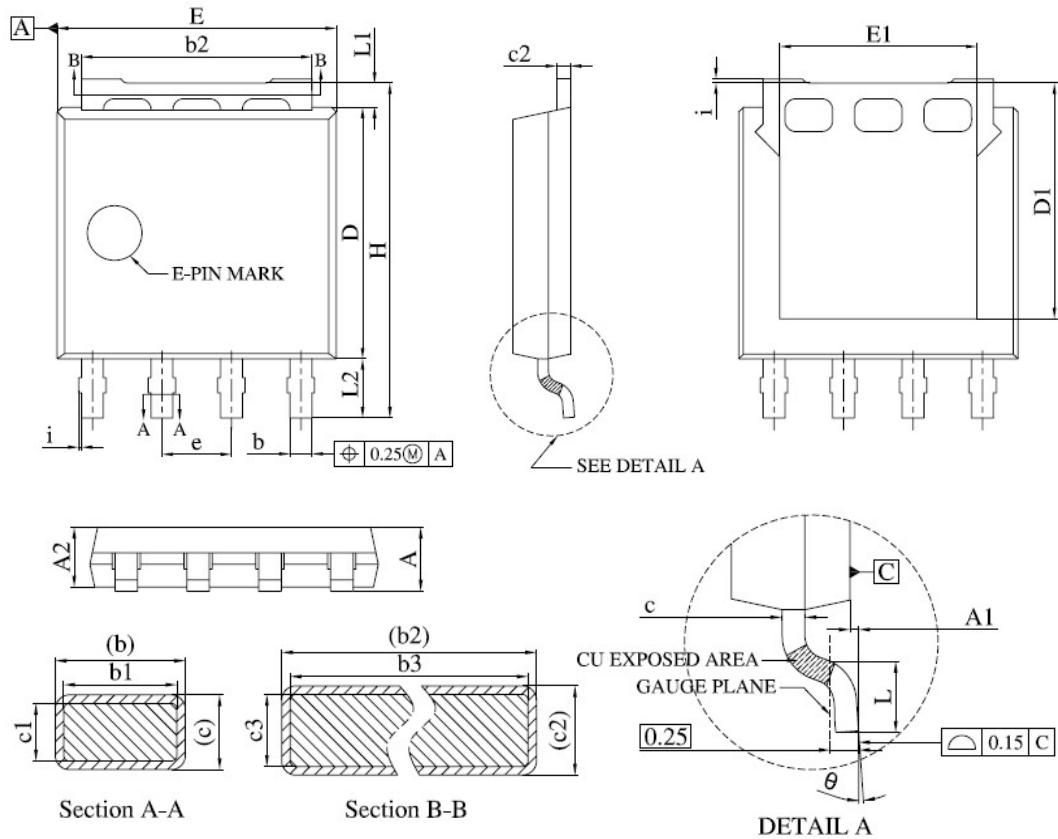
7. Typical Characteristics (cont.)



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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°