

N-Channel Enhancement Mode MOSFET

1. Product Information

1.1 Features

- ✓ Surface-mounted package
- ✓ MSL1
- ✓ Advanced trench cell design
- ✓ Tj Max 175°C

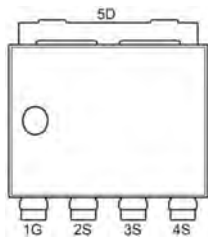
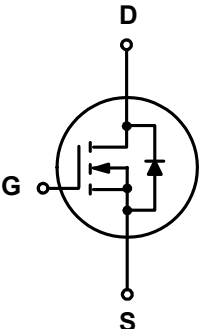
1.2 Applications

- ✓ Li-batthey protection
- ✓ DC-DC
- ✓ High power inverter system

1.3 Quick reference

- ✓ $BV \geq 40\text{ V}$
- ✓ $P_{tot} \leq 375\text{ W}$
- ✓ $I_D \leq 715\text{ A}$
- ✓ $R_{DS(ON)} \leq 0.40\text{ m}\Omega$ @ $V_{GS} = 10\text{ V}$
- ✓ $R_{DS(ON)} \leq 1.10\text{ m}\Omega$ @ $V_{GS} = 6\text{ V}$

2. Pin Description

Pin	Description	Simplified Outline	Symbol
1	Gate(G)	 Top View LFPAK88	
2,3,4	Source(S)		
5	Drain(D)		

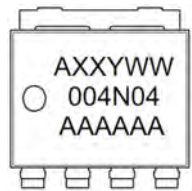
3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-	40	V
V_{GS}	Gate-Source Voltage	$T_C = 25\text{ }^{\circ}\text{C}$	-	± 20	V
$I_{D^{*},***}$	Drain Current (Silicon limited)	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$		715	A
	Drain Current (DC)	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	400	A
		$T_C = 100\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	400	A
I_{DM}^{***}	Drain Current (Silicon limited)	$T_C = 25\text{ }^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	2860	A
P_{tot}	Drain 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	Continuous-Source Current	$T_C = 25\text{ }^{\circ}\text{C}$	-	715	A
E_{AS}	Single Pulsed Avalanche Energy	$V_{DD}=40\text{ V}, L=1.0\text{mH}$	-	3042	mJ
$R_{\theta JA}^{**}$	Thermal Resistance- Junction to Ambient		-	43	$^{\circ}\text{C/W}$
$R_{\theta JC}$			-	0.4	

Notes :

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

4. Marking Information

Product Name	Marking
UK004N04L8	

5. Ordering Code

Product Name	Package	Reel Size	Tape width	Quantity	Note
UK004N04L8	LFPAK88			2000	

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 _{GS} = 0 V, 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} = 50 A	-	0.35	0.40	mΩ
		V _{GS} = 6 V, I _{DS} = 30 A	-	0.93	1.10	
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} = 50 A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	-	67	-	nS
Q _{rr}	Reverse Recovery Charge		-	77	-	nC
Dynamic Characteristics ^b						
C _{iss}	Input Capacitance	V _{GS} = 0 V, V _{DS} = 20 V Frequency = 1 MHz	-	12933	-	pF
C _{oss}	Output Capacitance		-	5236	-	
C _{rss}	Reverse Transfer Capacitance		-	201	-	
t _{d(on)}	Turn-on Delay Time	V _{DS} = 20 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 0.4 Ω, I _{DS} = 50 A	-	36	-	nS
t _r	Turn-on Rise Time		-	168	-	
t _{d(off)}	Turn-off Delay Time		-	156	-	
t _f	Turn-off Fall Time		-	159	-	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} = 20 V, V _{GS} = 10 V, I _{DS} = 50 A	-	216	-	nC
Q _{gs}	Gate-Source Charge		-	69	-	
Q _{gd}	Gate-Drain Charge		-	46	-	

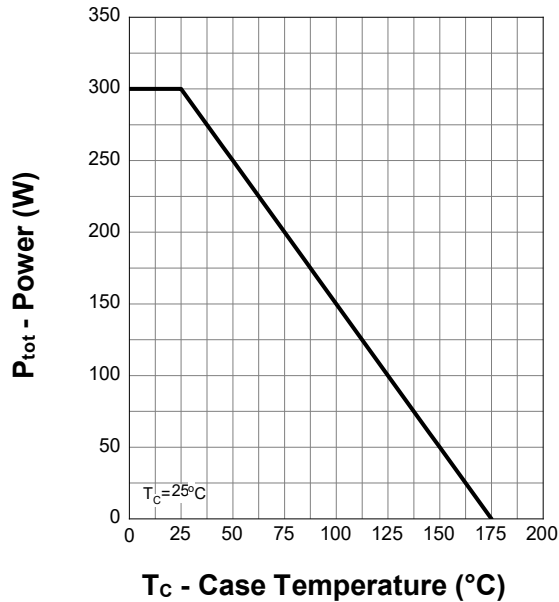
Notes :

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

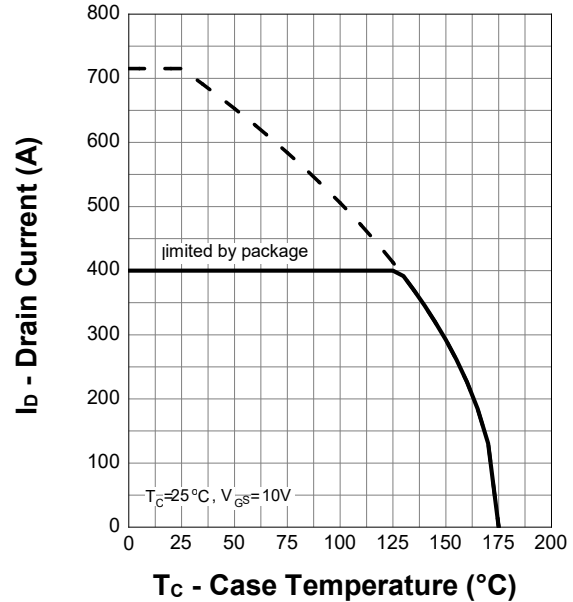
b : Guaranteed by design, not subject to production testing

7. Typical Characteristics

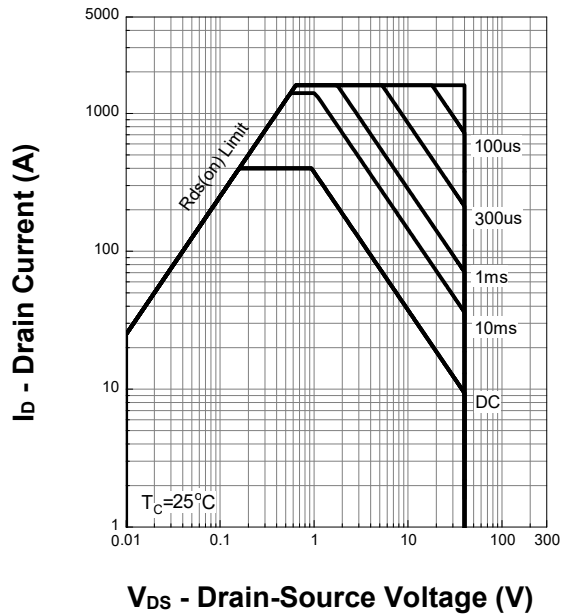
Power Capability



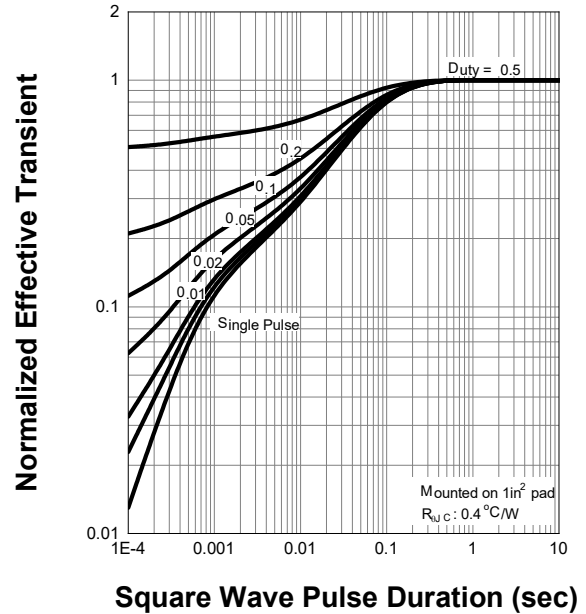
Current Capability



Safe Operating Area

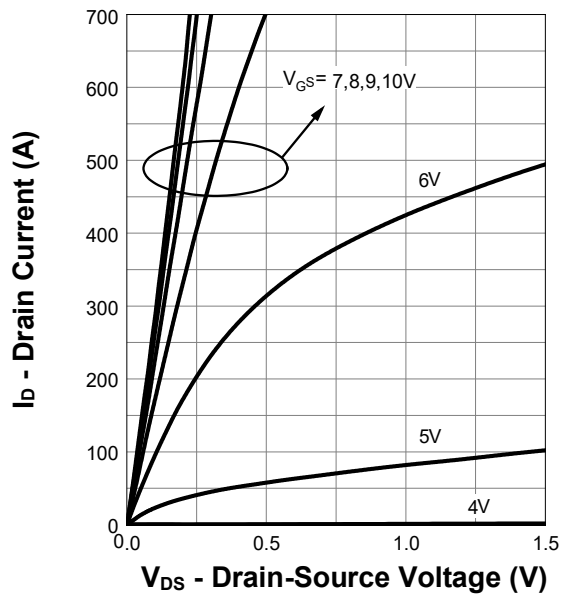


Transient Thermal Impedance

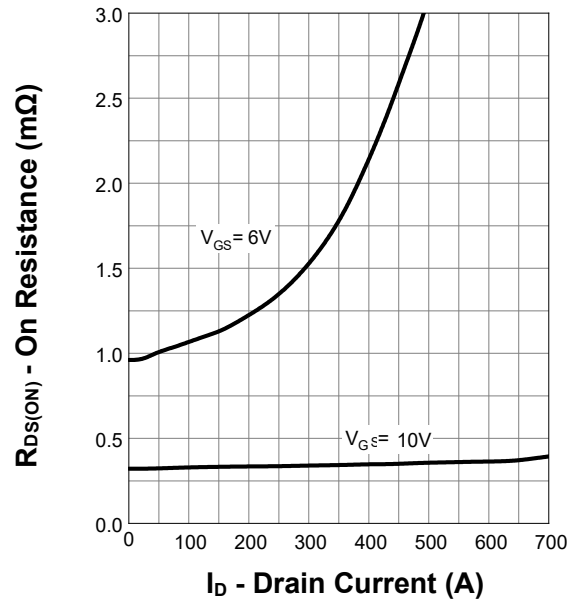


7. Typical Characteristics (cont.)

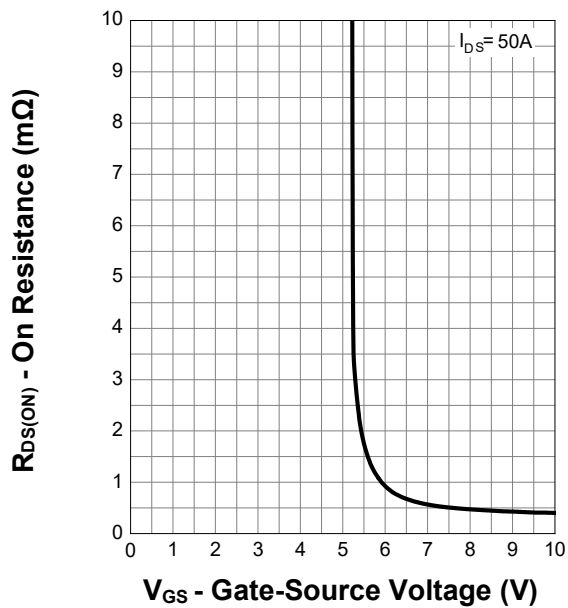
Output Characteristics



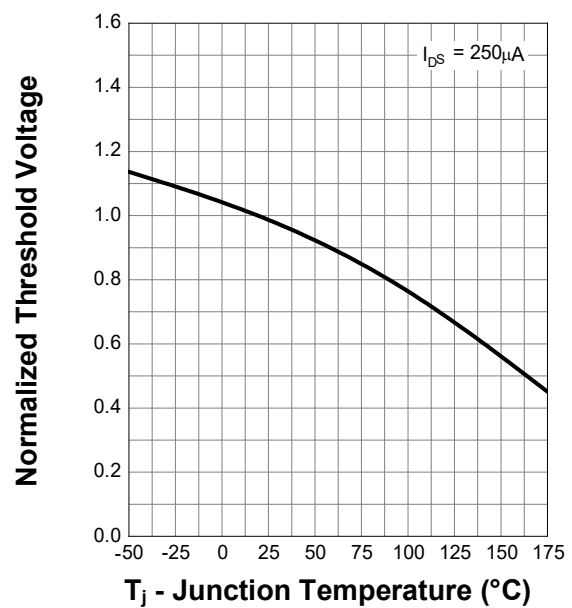
On Resistance



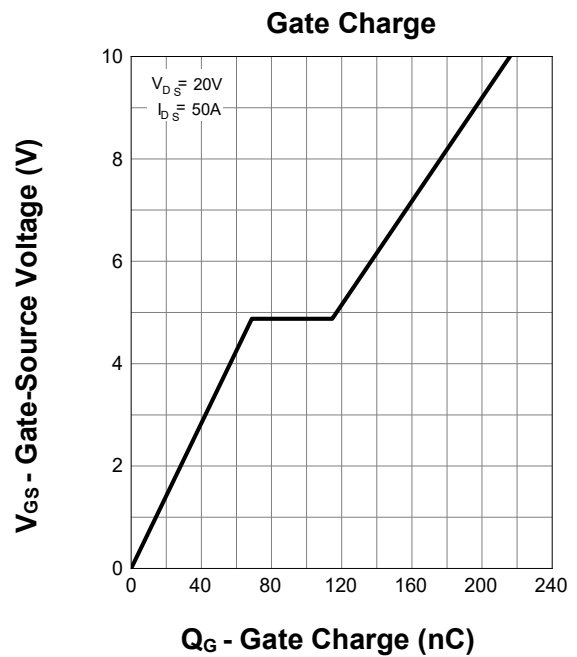
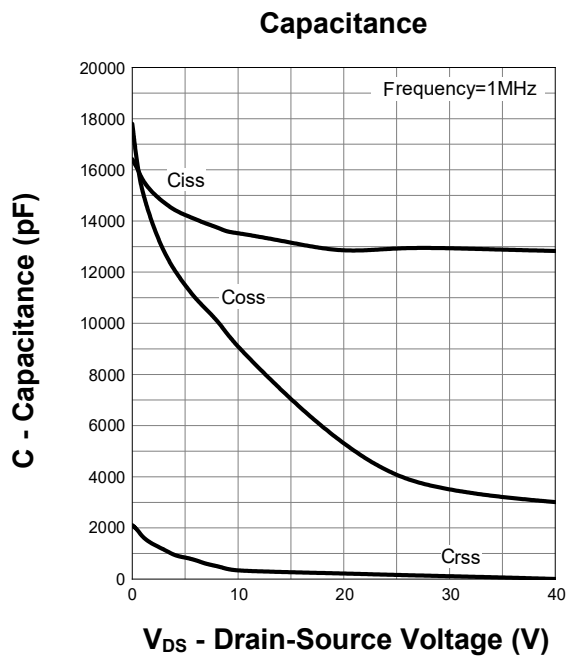
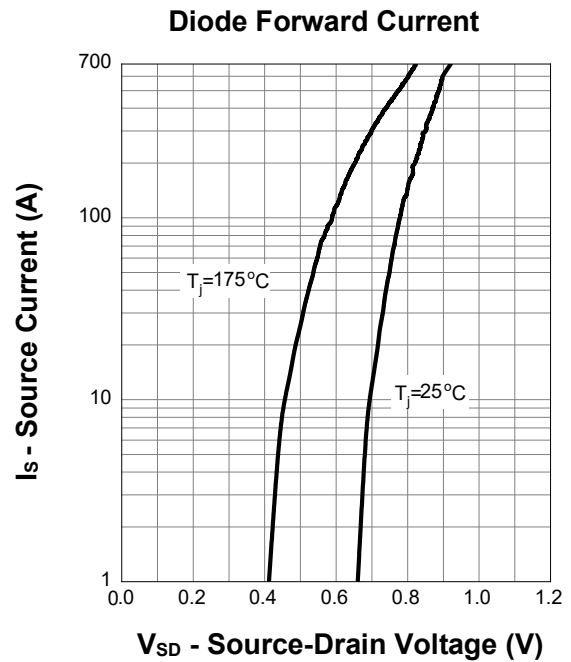
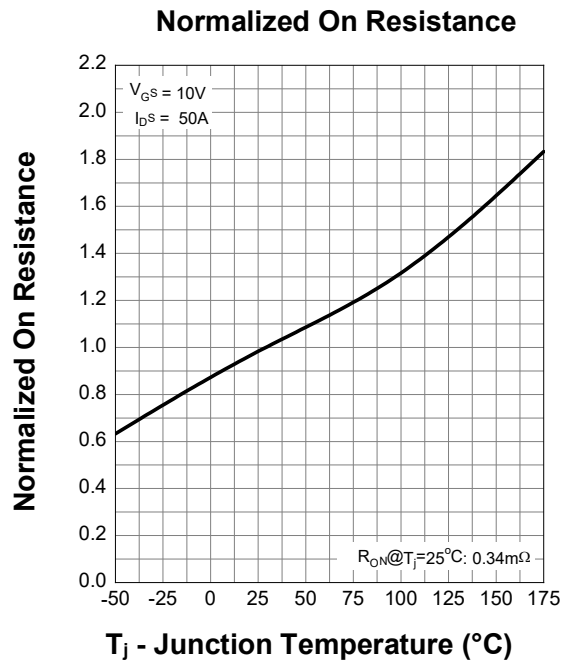
Transfer Characteristics



Normalized Threshold Voltage



7. Typical Characteristics (cont.)



8. Package Dimensions

LFPK88 Package

