

N-channel Enhancement Mode Power MOSFET

Features

- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- 100% avalanche tested
- Improved dv/dt capability

Applications

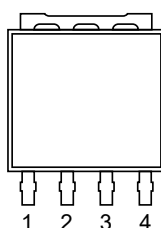
- PWM Application
- Motor drivers
- DC/DC Converter

Product Summary

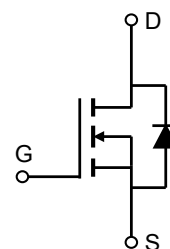
Parameters	Value	Unit
V_{DSS}	40	V
$V_{GS(th_Typ)}$	2.8	V
$I_D(@V_{GS}=10V)$	198	A
$R_{DS(ON)_Typ}(@V_{GS}=10V)$	0.8	$m\Omega$
$R_{DS(ON)_Typ}(@V_{GS}=4.5V)$	1.10	$m\Omega$



LFPK5x6-4L Top View



Marking



Schematic Diagram

MAXIMUM RATINGS ($T_a=25^{\circ}C$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C = 25^{\circ}C$	I_D	198	A
	$T_C = 100^{\circ}C$		94	
Pulsed Drain Current		I_{DM}	1098	A
Single Pulsed Avalanche Energy		E_{AS}	900	mJ
Power Dissipation		P_D	360	W
Thermal Resistance from Junction to Ambient		$R_{\theta JA}$	60	$^{\circ}C/W$
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^{\circ}C$

MOSFET ELECTRICAL CHARACTERISTICS

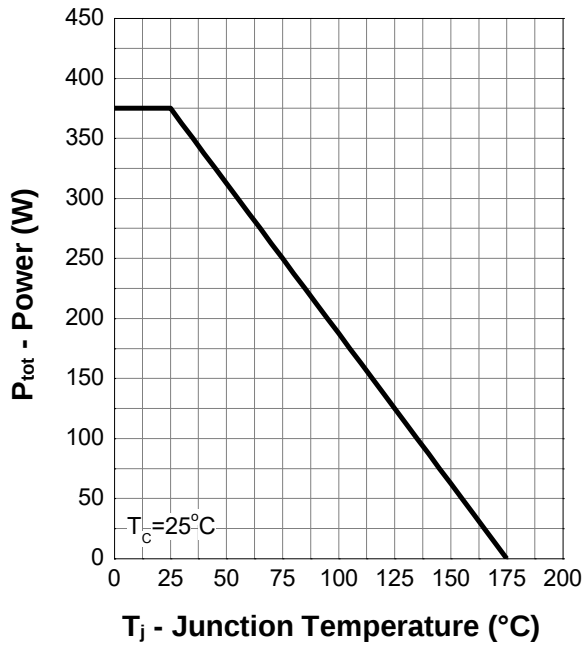
$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = 250 μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 40V, V _{GS} =0V			1.0	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} =±20V			±100	nA
On characteristics ④						
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA		2.8	3.4	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =10V, I _D =15A		0.8	0.98	mΩ
		V _{GS} =4.5V, I _D =20A		1.10	1.20	mΩ
Dynamic characteristics ④ ⑤						
Input capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V f =1MHz		5800		pF
Output capacitance	C _{oss}			3200		
Reverse transfer capacitance	C _{rss}			240		
Gate Poly Resistance	R _g	f =1MHz		1.1		Ω
Switching characteristics ④ ⑤						
Total gate charge	Q _g	V _{GS} =0 to 10V V _{DS} =20V, I _D =30A		155		nC
Gate-source charge	Q _{gs}			25		
Gate-drain charge	Q _{gd}			35		
Turn-on delay time	t _{d(on)}	V _{DS} =20V, I _D =20A V _{GS} =10V, R _{GEN} =3Ω		16		ns
Turn-on rise time	t _r			56		
Turn-off delay time	t _{d(off)}			149		
Turn-off fall time	t _f			96		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V _{SD} ④	V _{GS} =0V, I _{SD} =30A			1.3	V
Continuous drain-source diode forward current	I _S ①	T _C =25℃			140	A
Reverse recovery time	trr	di/dt = 100A/μs, I _F = 30A		85		ns
Reverse recovery charge	Qrr			120		nC

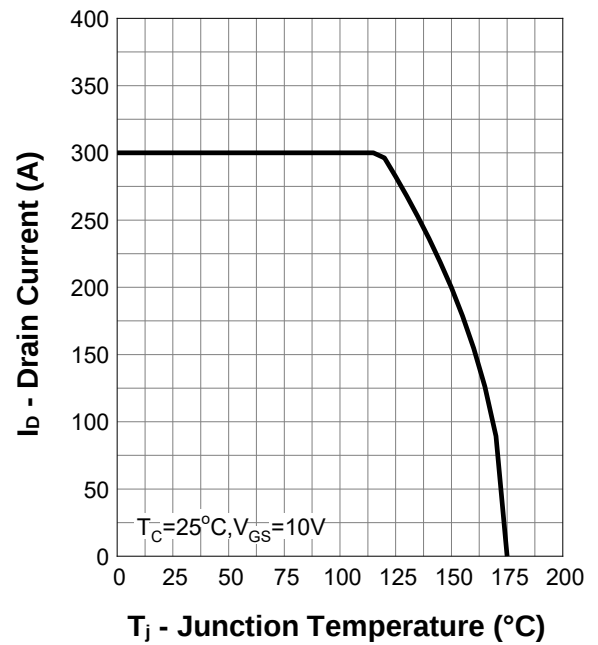
Notes:

1. Guaranteed by design, not subject to production testing
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$

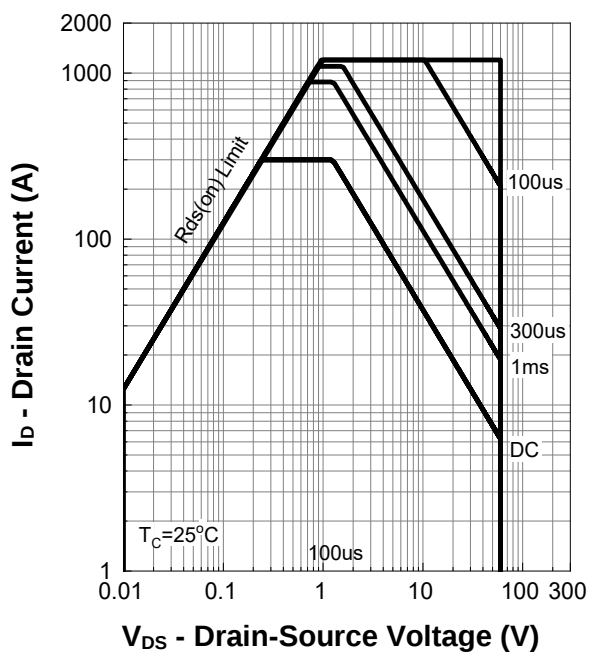
Power Capability



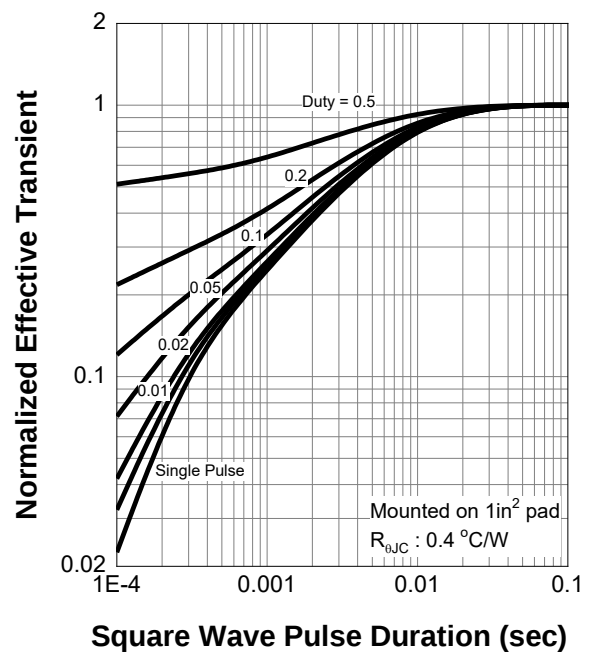
Current Capability

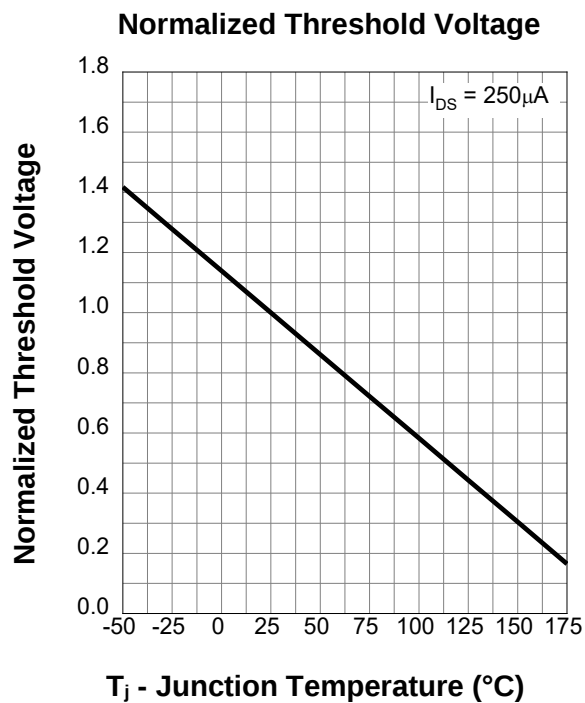
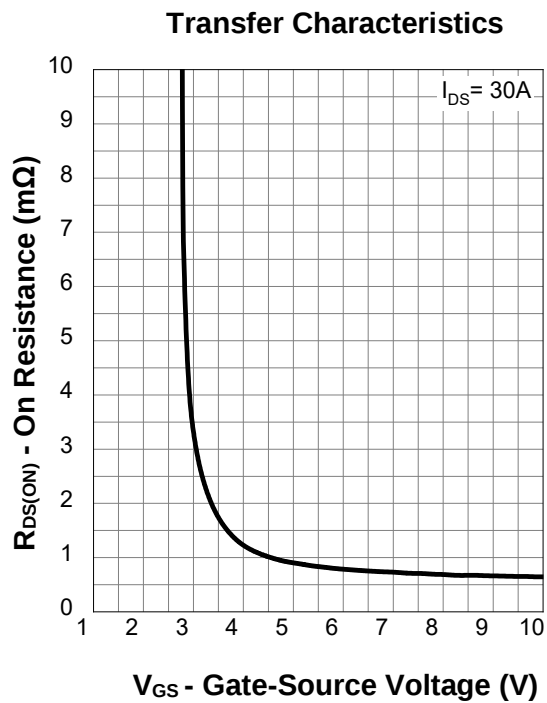
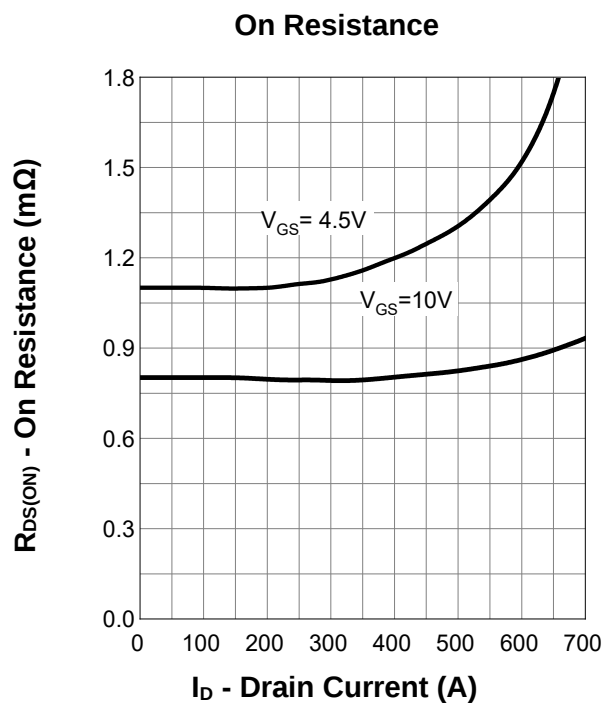
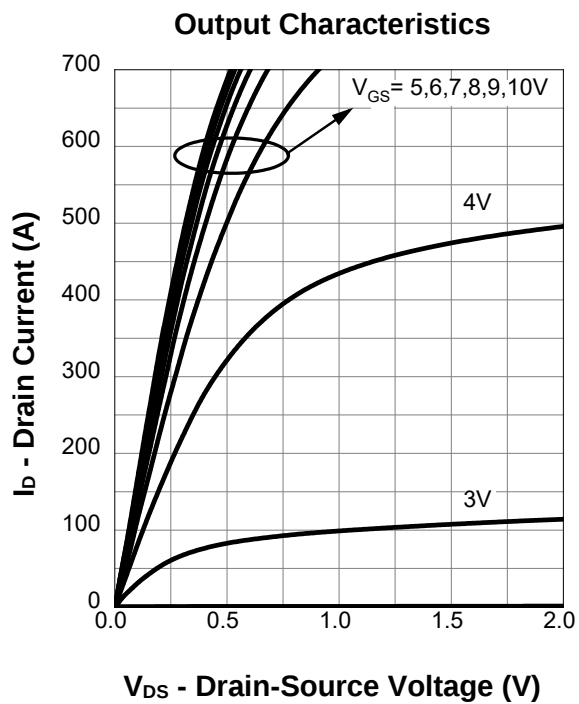


Safe Operation Area

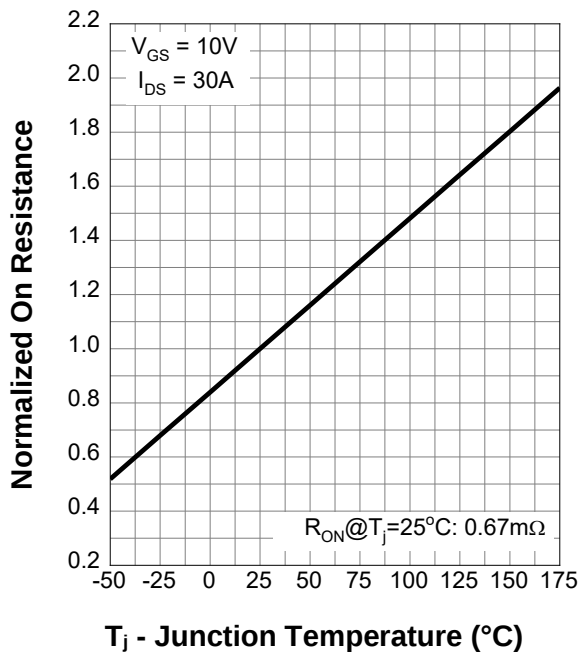


Transient Thermal Impedance

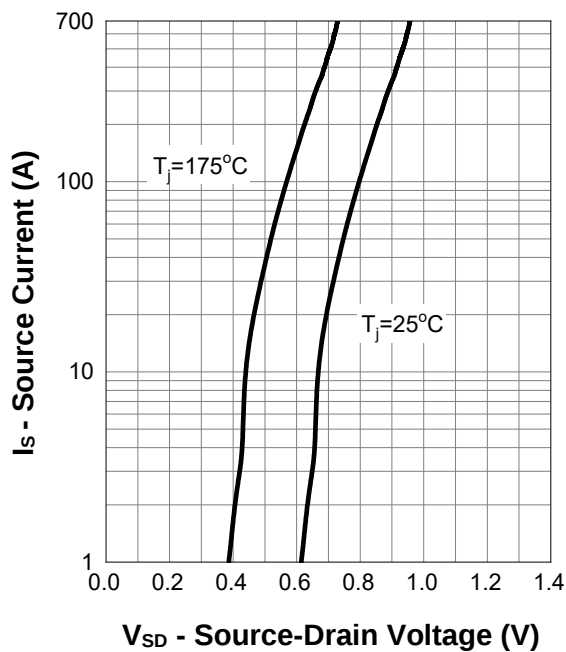




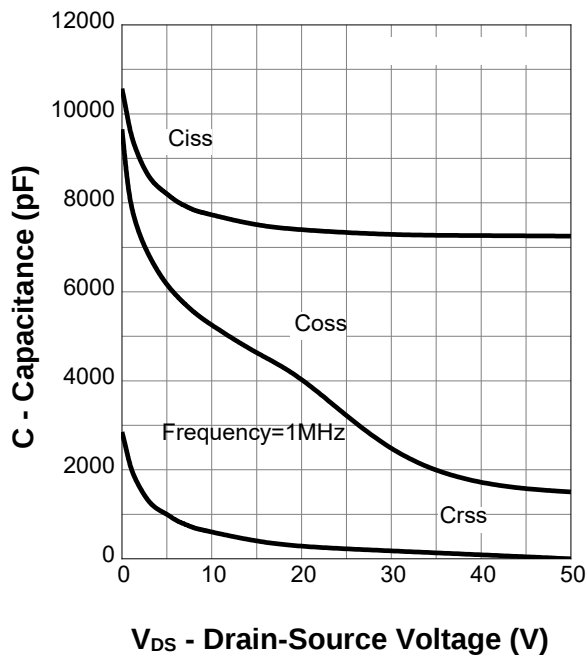
Normalized On Resistance



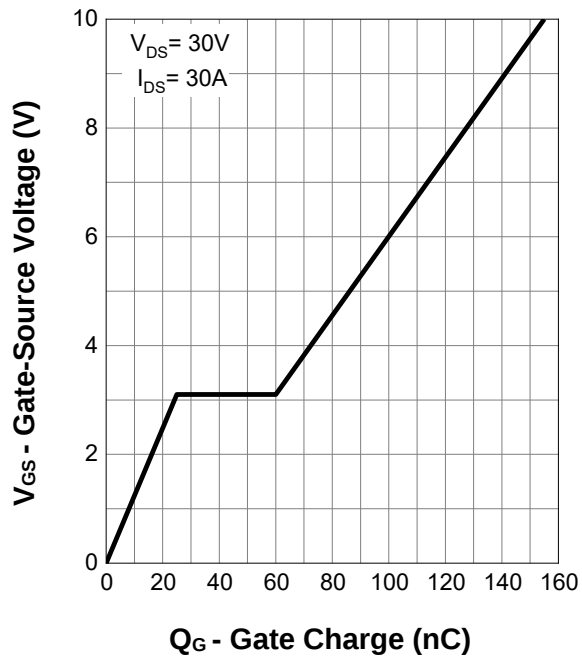
Diode Forward Current



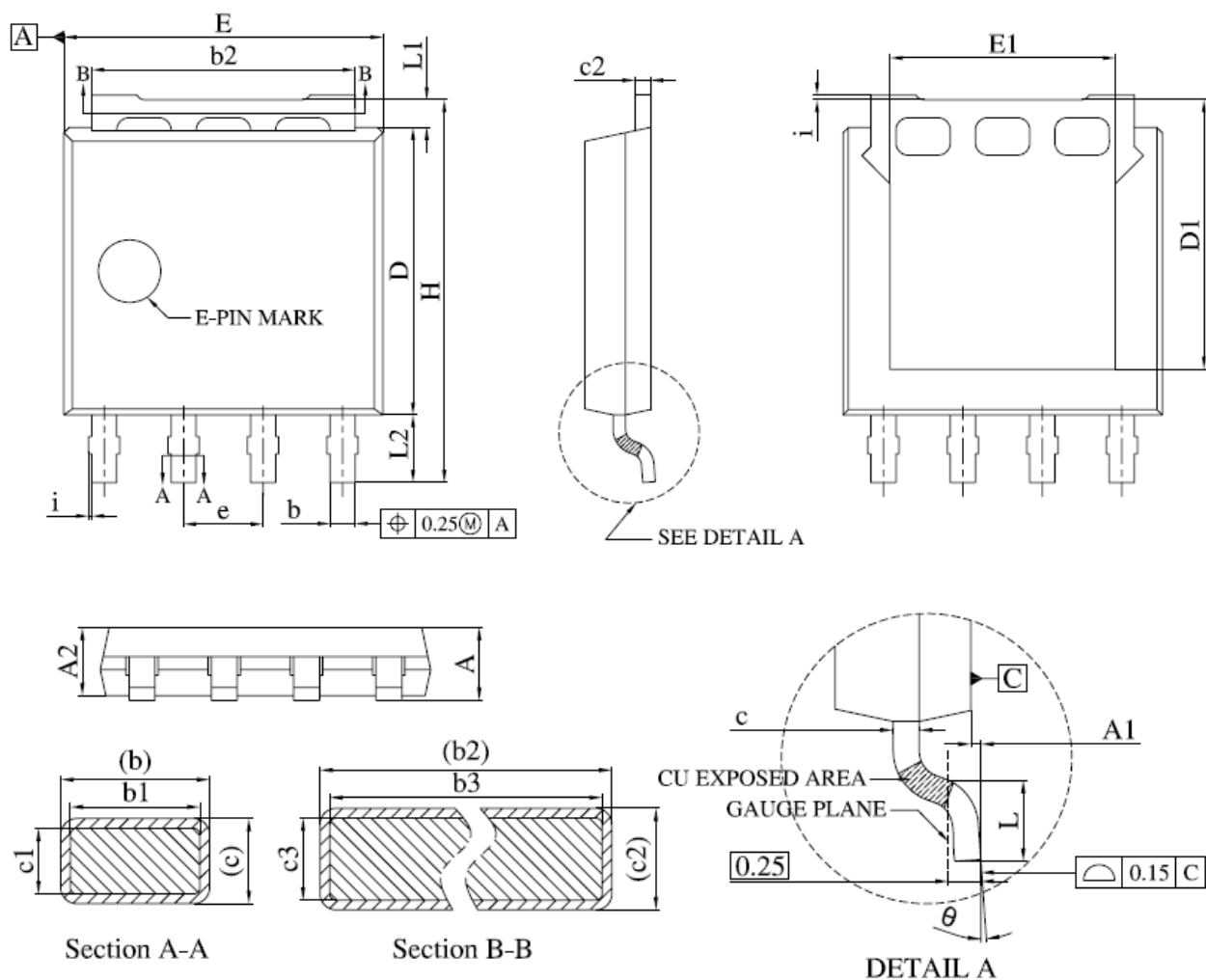
Capacitance



Gate Charge



Package Mechanical Data(LFPAK5x6-4L)



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°