N-Channel Enhancement Mode Power MOSFET

Dual Asymmetric N-Channel MOSFET

- **Features**

V_{DS} = 30V,

I_D = 48.7A

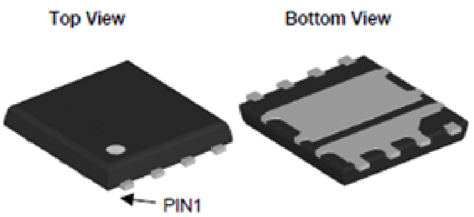
$R_{DS(ON)}$ @V_{GS} = 10V TYP 3.8mΩ

$R_{DS(ON)}$ @V_{GS} = 4.5V TYP 6.0mΩ

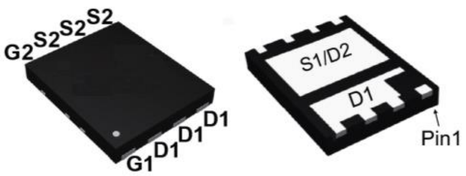
- **General Description**

• CPU core power
• POL
• Computer / server peripherals
• Synchronous buck converter
• Telecom DC/DC

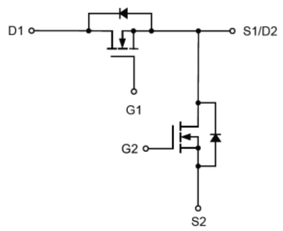
- **Pin Configurations**



PDFN5*6-8L



TDFN5*6-8L



N-Channel MOSFET

- **Absolute Maximum Ratings** @Tc=25℃ unless otherwise noted

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	30	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Continuous) *C	Tc=25°C	I_D	48.7	A
	Tc=70°C		39	
Drain Current (Pulse) *B		I_{DM}	195	A
Power Dissipation	Tc=25°C	P_D	20.2	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	°C

- **Thermal Resistance Ratings**

Parameter		Symbol	Maximum	Unit
Maximum Junction-to-Ambient *A	t ≤ 10 s	R_{thJA}	20	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	6.2	

- **Electrical Characteristics** @T_A=25℃ unless otherwise noted

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static *D						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_{DS} = 250μA	1	--	2.5	V
Gate Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	--	--	±100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 10A	--	3.8	5.0	mΩ
	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 7A	--	6.0	7.8	mΩ
Diode Forward Voltage	V_{SD}	I_{SD} = 1A , V_{GS} = 0V	--	--	1.2	V
Diode Forward Current *C	I_S	T_C = 25°C	--	--	16.8	A
Switching						
Total Gate Charge	Q_g	V_{DS} = 15V, I_D = 10A, V_{GS} = 5V	--	13.8	--	nC
Gate-Source Charge	Q_{gs}		--	2.5	--	nC
Gate-Drain Charge	Q_{gd}		--	8	--	nC
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D = 1A, V_{GS} = 10V, R_{GEN} = 6Ω	--	14.5	--	ns
Turn-on Rise Time	t_r		--	7.5	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	37	--	ns
Turn-Off Fall Time	t_f		--	12	--	ns
Dynamic						
Input Capacitance	C_{iss}	V_{DS}= 15V,V_{GS}=0V, f=1.0MHz	--	760	--	pF
Output Capacitance	C_{oss}		--	186	--	pF
Reverse Transfer Capacitance	C_{rss}		--	116	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the t≤ 10s junction to ambient thermal resistance rating.

D: Pulse Test：Pulse Wide≤ 300μs，Duty Cycle≤ 2%.

- **Typical Performance Characteristics（(TJ = 25 °C, unless otherwise noted)）**

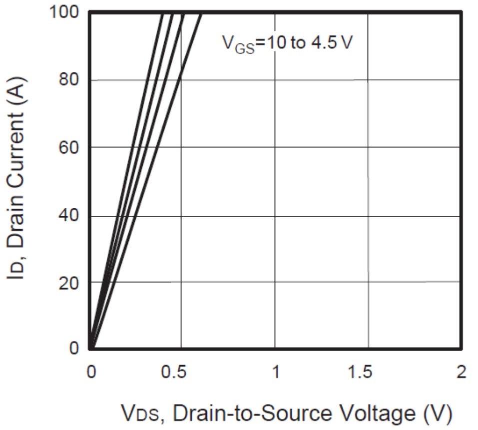


Figure 1. Output Characteristics

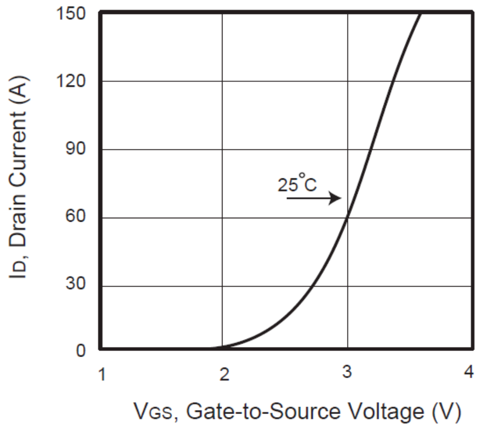


Figure 2. Transfer Characteristics

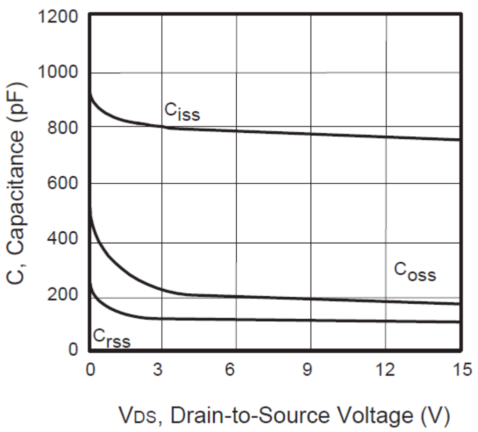


Figure 3. Capacitance

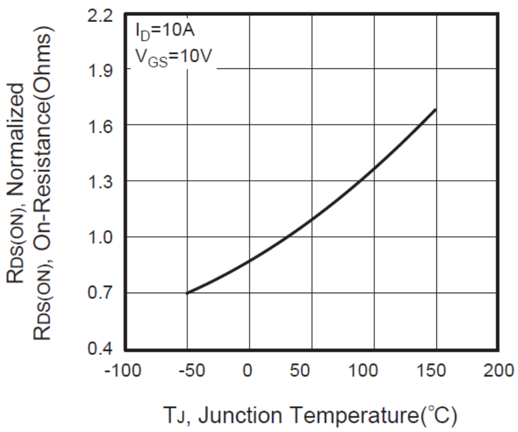


Figure 4. On-Resistance Variation with Temperature

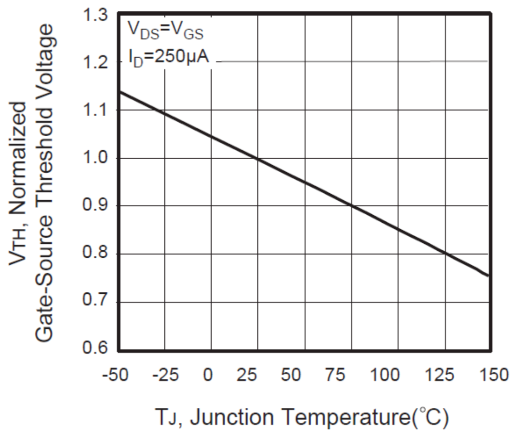


Figure 5. Gate Threshold Variation with Temperature

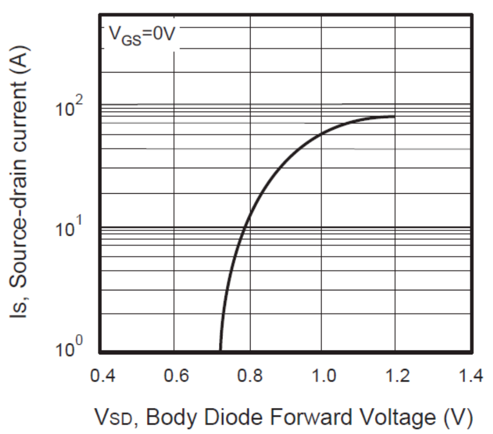


Figure 6. Body Diode Forward Voltage Variation with Source Current

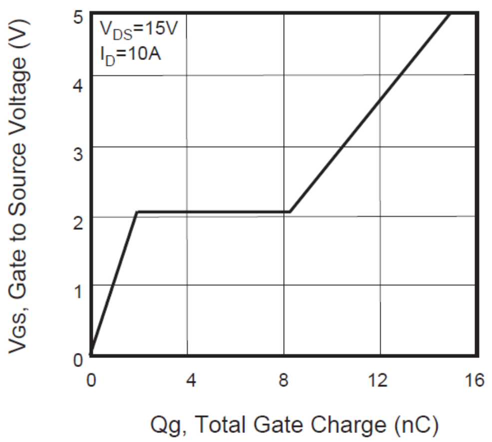


Figure 7. Gate Charge

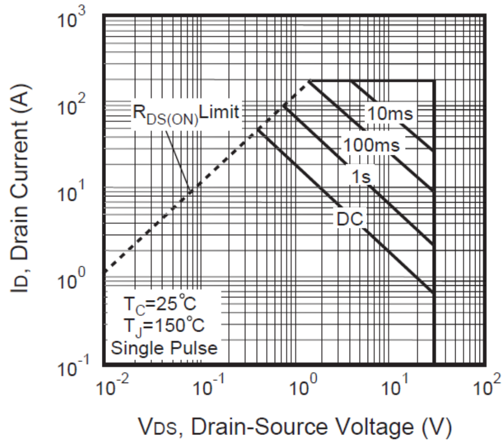


Figure 8. Maximum Safe Operating Area

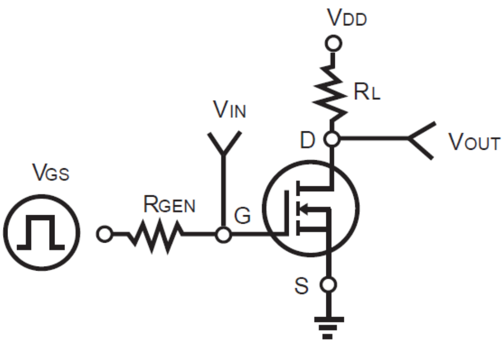


Figure 9. Switching Test Circuit

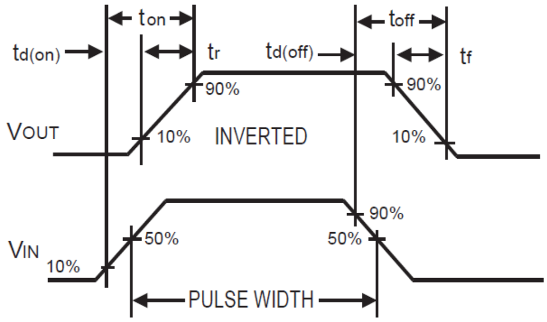


Figure 10. Switching Waveforms

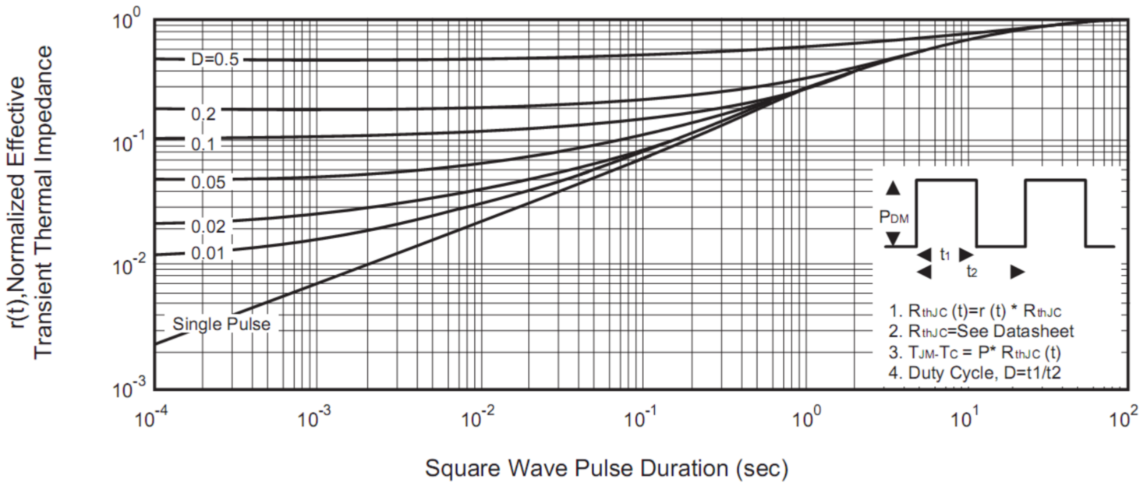
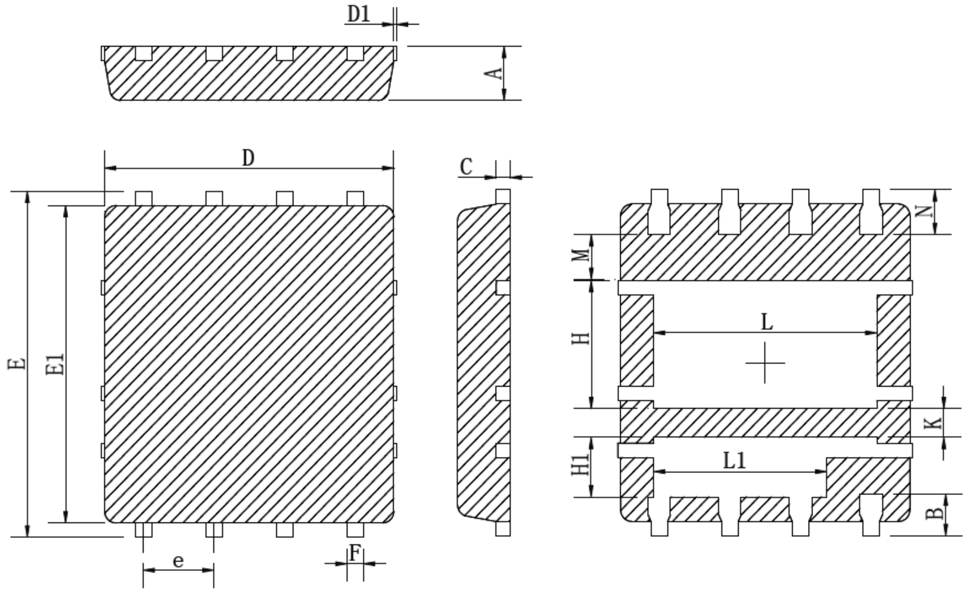


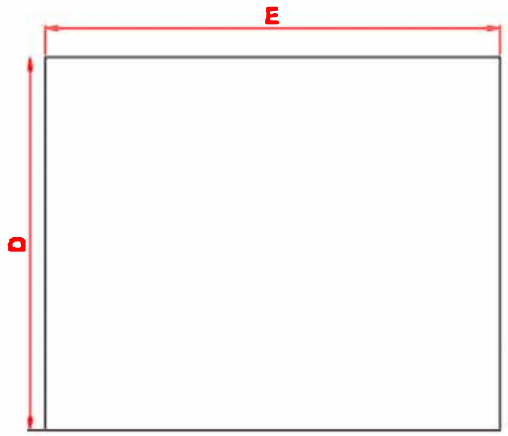
Figure 11. Normalized Thermal Transient Impedance Curve

- **Package Information**

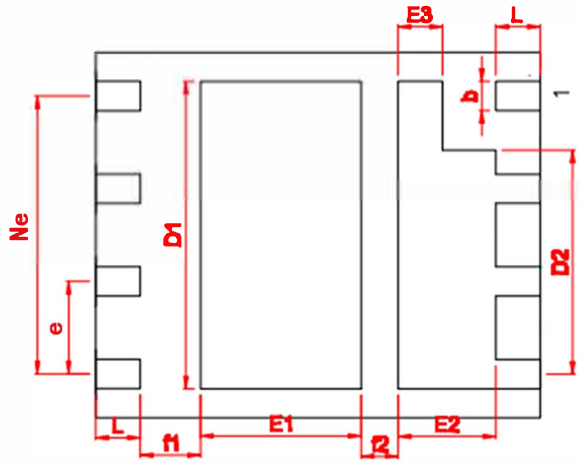
LTS6694FTB OUTLINE



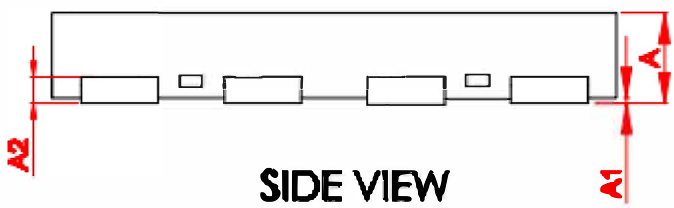
Symbol	Min	Typ	Max
A	0.90	0.95	1.00
B	0.60	0.70	0.80
C	0.20	0.254	0.30
D	5.10	5.20	5.30
D1			0.12
E	5.95	6.05	6.15
E1	5.40	5.55	5.70
e	1.22	1.27	1.32
F	0.25	0.30	0.35
H	2.12	2.22	2.32
H1	0.94	1.04	0.14
L	3.80	4.00	4.20
M	0.70	0.80	0.90
N	0.65	0.75	0.85
K	0.40	0.50	0.60



TOP VIEW



BOTTOM VIEW



SIDE VIEW

SYMBOL	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.700	0.750	0.800
A1	0.000	0.020	0.050
b	0.360	0.410	0.480
A2	0.190	0.210	0.250
D	4.900	5.000	5.100
D1	4.150	4.200	4.250
D2	2.870	3.070	3.270
E	5.900	6.000	6.100
E1	2.020	2.170	2.320
E2	1.220	1.320	1.420
E3	0.550	0.600	0.650
e	1.220	1.270	1.320
Ne	BSC 3.810		
f1	0.710	0.810	0.910
f2	0.400	0.500	0.600
L	0.550	0.600	0.650

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245℃±5℃	5sec±1sec
Pb-Free device	260℃+0/-5℃	5sec±1sec

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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