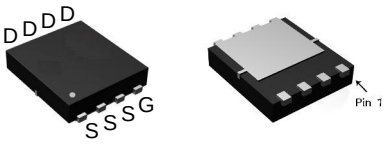
Features

- 30V/54A,
  $R_{DS(ON)}$= 4.5mΩ (typ.) @ V_{GS}=10V
  $R_{DS(ON)}$= 6.5mΩ (typ.) @ V_{GS}=4.5V
- Reliable and Rugged
- Lower Q_g and Q_{gd} for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- 100% UIS + R_g Tested
- Lead Free and Green Devices Available
  (RoHS Compliant)

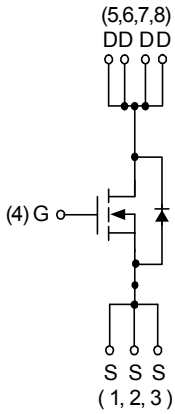
Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Pin Description



PDFN3.3*3.3-8L



N-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	T_C=25°C	54	A
I_D	Continuous Drain Current	T_C=25°C	54	
		T_C=100°C	21	
I_{DM} [a]	Pulsed Drain Current	T_C=25°C	164	
P_D	Maximum Power Dissipation	T_C=25°C	26.6	W
		T_C=100°C	10.6	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	4.7	°C/W
I_D [b]	Continuous Drain Current	T_A=25°C	13.8	A
		T_A=70°C	11	
I_{DM} [b]	Pulsed Drain Current	T_A=25°C	34	
P_D [b]	Maximum Power Dissipation	T_A=25°C	1.73	W
		T_A=70°C	1.11	
$R_{\theta JA}$ [b]	Thermal Resistance-Junction to Ambient	t ≤ 10s	40	°C/W
		Steady State	72	
I_{AS} [c]	Avalanche Current, Single pulse	L=0.1mH	31	A
E_{AS} [c]	Avalanche Energy, Single pulse	L=0.1mH	48	mJ

Note a：Pulse width is limited by max. junction temperature.
Note b：$R_{\theta JA}$ steady state t=999s.
Note c：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).

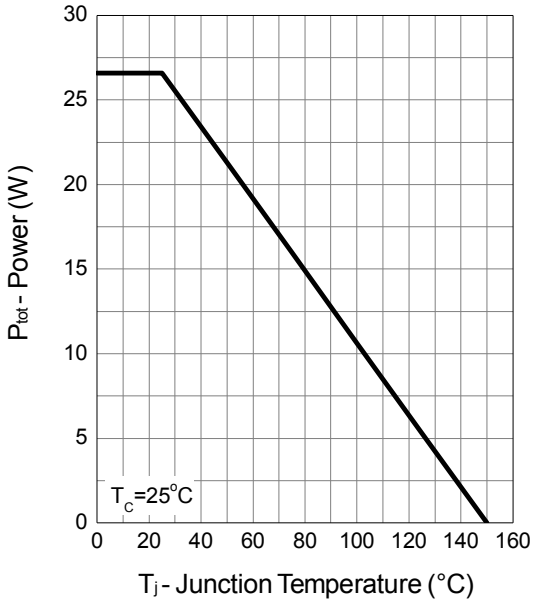
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
BV_{DSSt}	Drain-Source Breakdown Voltage (transient)	VGS=0V, $I_{D(aval)}$=20A T_{case}=25°C, $t_{transient}$=100ns	34	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=24V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.5	1.8	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [d]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=12A	-	4.5	6	mΩ
		T_J=125°C	-	6	-	
		V_{GS}=4.5V, I_{DS}=9A	-	6.5	8	
Gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=10A	-	16	-	S
Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	I_{SD}=10A, V_{GS}=0V	-	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=5A, dI_{SD}/dt=100A/μs	-	11	-	ns
t_a	Charge Time		-	14	-	
t_b	Discharge Time		-	25	-	
Q_{rr}	Reverse Recovery Charge		-	13	-	nC
Dynamic Characteristics						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1.8	3	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	1150	-	pF
C_{oss}	Output Capacitance		-	160	-	
C_{rss}	Reverse Transfer Capacitance		-	137	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=1Ω	-	7.8	-	ns
t_r	Turn-on Rise Time		-	8.4	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	18	-	
t_f	Turn-off Fall Time		-	17	-	
Gate Charge Characteristics						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=12A	-	12	18	nC
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_{DS}=12A	-	5.5	-	
Q_{gth}	Threshold Gate Charge		-	1.1	-	
Q_{gs}	Gate-Source Charge		-	1.9	-	
Q_{gd}	Gate-Drain Charge		-	2.2	-	

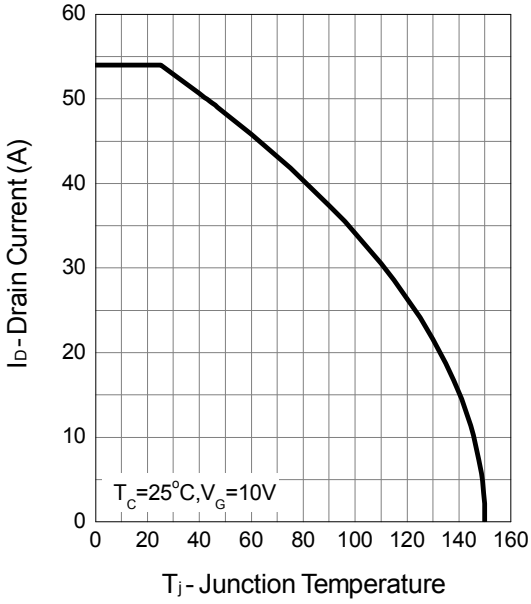
Note d：Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Operating Characteristics

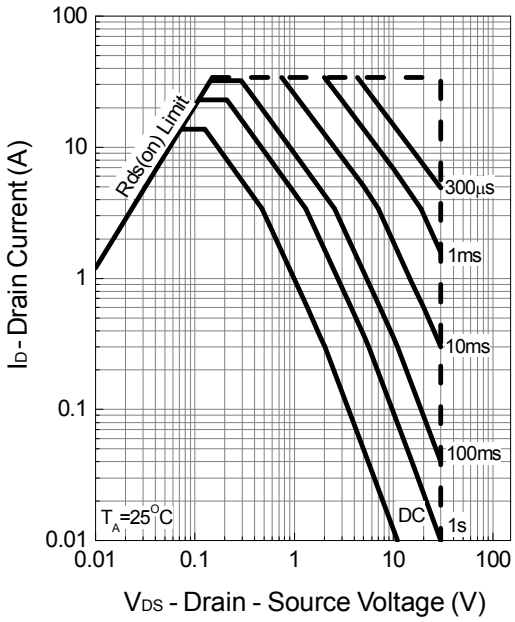
Power Dissipation



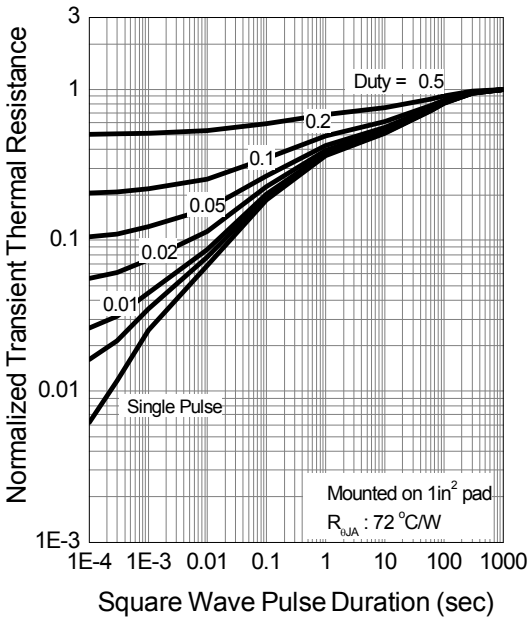
Drain Current



Safe Operation Area

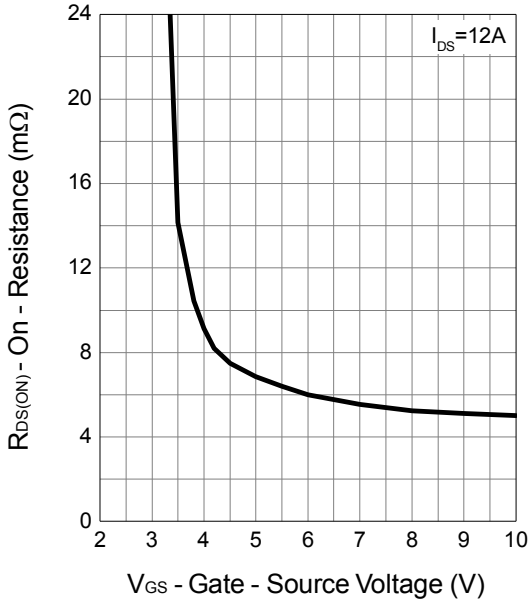


Thermal Transient Impedance

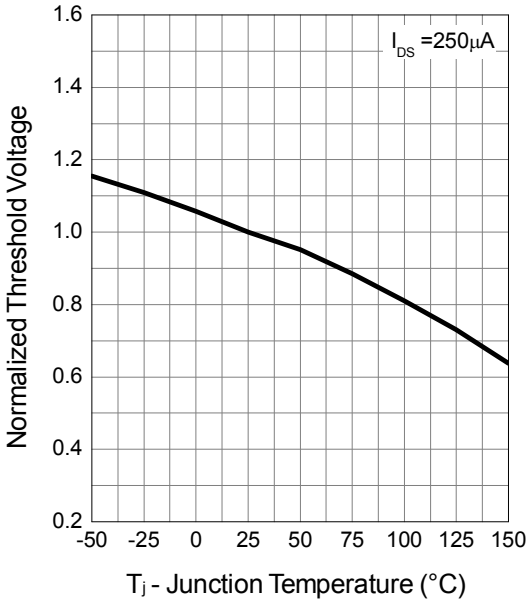


Typical Operating Characteristics (Cont.)

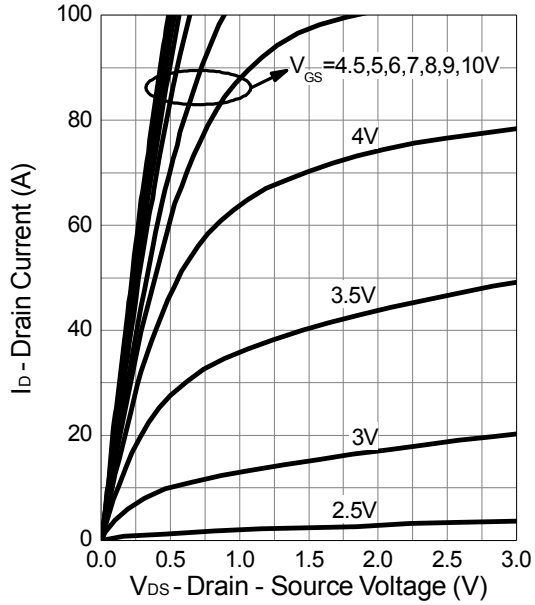
Gate-Source On Resistance



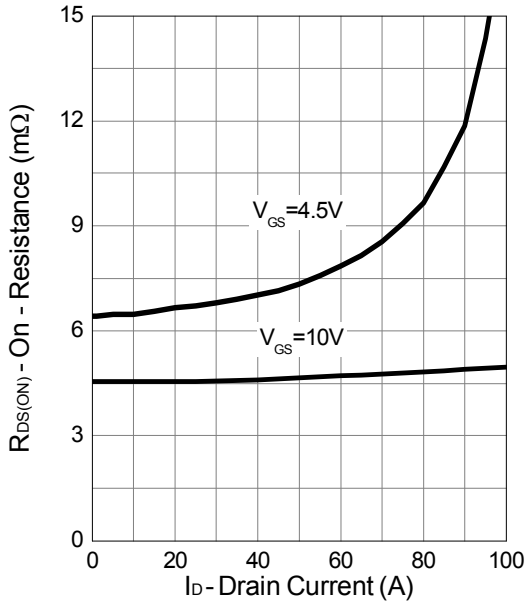
Gate Threshold Voltage



Output Characteristics

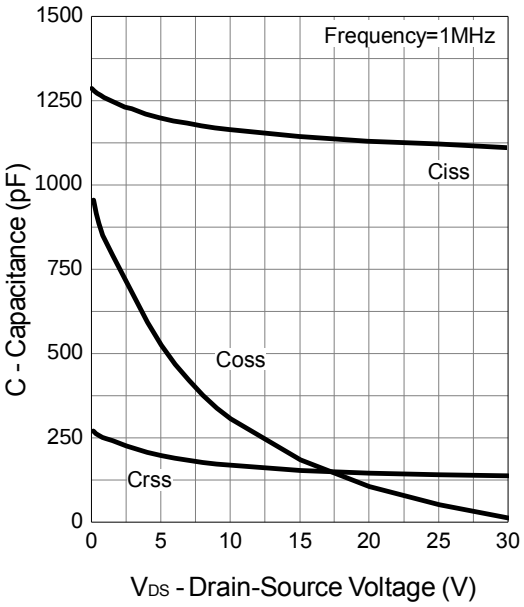


Drain-Source On Resistance

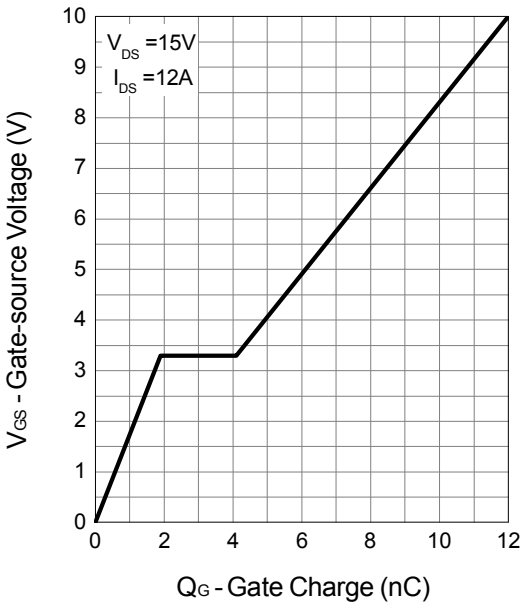


Typical Operating Characteristics (Cont.)

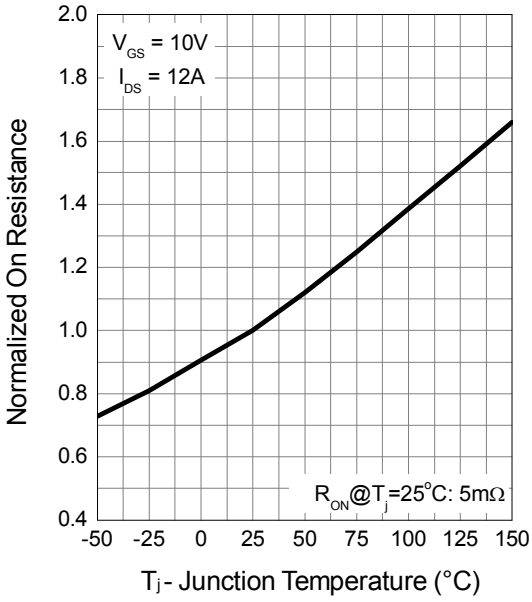
Capacitance



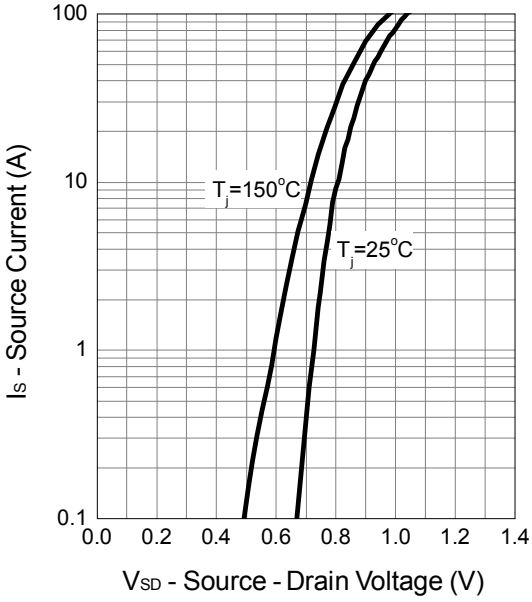
Gate Charge



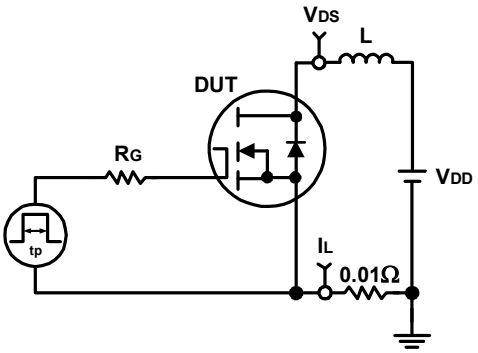
Drain-Source On Resistance

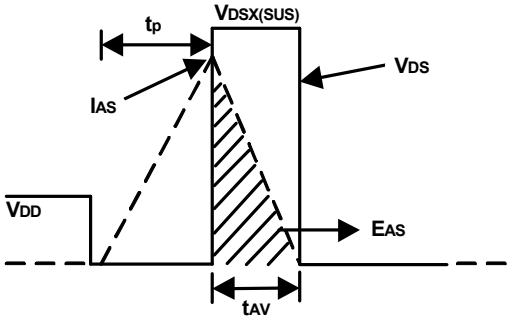


Source-Drain Diode Forward

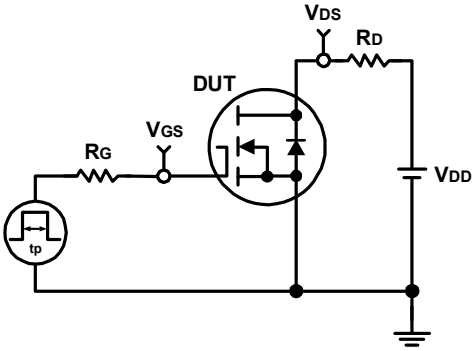


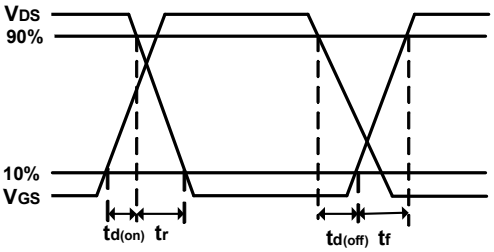
Avalanche Test Circuit and Waveforms





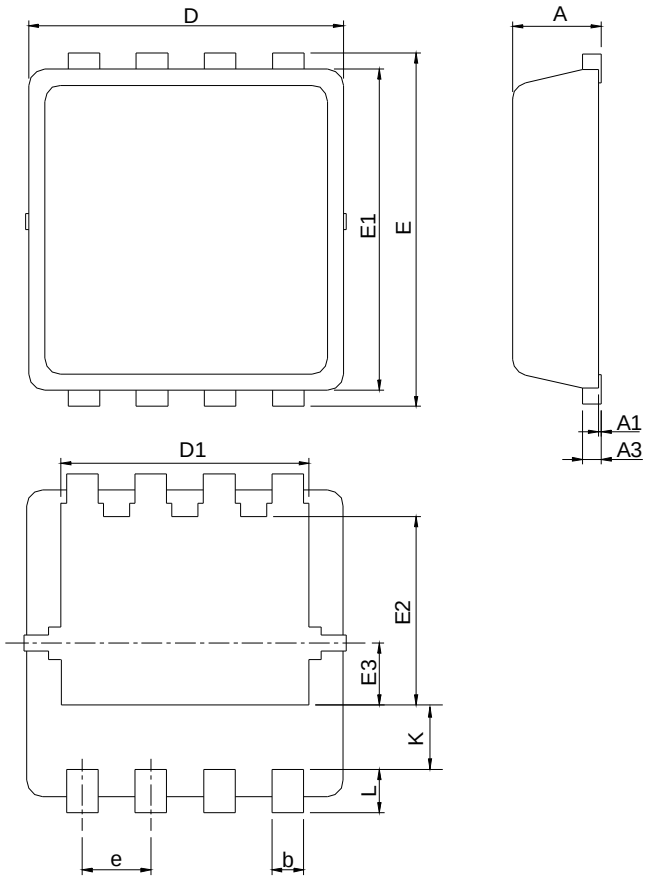
Switching Time Test Circuit and Waveforms





Package Information

PDFN3.3*3.3-8L



SYMBOL	PDFN3.3*3.3-8L			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.80	1.00	0.031	0.039
A1	0.00	0.05	0.000	0.002
A3	0.10	0.25	0.004	0.010
b	0.24	0.35	0.009	0.014
D	2.90	3.10	0.114	0.122
D1	2.25	2.45	0.089	0.096
E	3.10	3.30	0.122	0.130
E1	2.90	3.10	0.114	0.122
E2	1.65	1.85	0.065	0.073
E3	0.56	0.58	0.022	0.023
e	0.65 BSC		0.026 BSC	
K	0.475	0.775	0.019	0.031
L	0.30	0.50	0.012	0.020

RECOMMENDED LAND PATTERN