

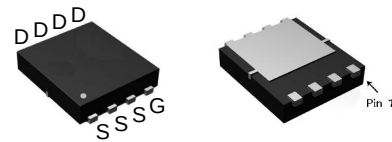
Features

- 30V/54A,
 $R_{DS(ON)} = 4m\Omega(\text{typ.}) @ V_{GS} = 10V$
 $R_{DS(ON)} = 6.3m\Omega(\text{typ.}) @ V_{GS} = 4.5V$
- Avalanche Rated
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

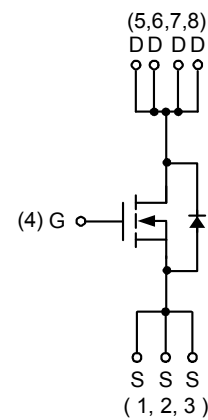
Applications

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

Pin Description



PDFN3.3x3.3_8L



N-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		± 20	
I_D^d	Continuous Drain Current ($V_{GS}=10\text{V}$)	$T_C=25^\circ\text{C}$	54	A
		$T_C=70^\circ\text{C}$	42	
I_{DM}	Pulsed Drain Current ($V_{GS}=10\text{V}$)	$T_C=25^\circ\text{C}$	110	
I_S	Diode Continuous Forward Current		40	
I_{AS}^b	Avalanche Current, Single pulse	$L=0.1\text{mH}$	25	mJ
E_{AS}^b	Avalanche Energy, Single pulse	$L=0.1\text{mH}$	31.25	
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	
P_D^d	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	29	W
		$T_C=70^\circ\text{C}$	19	
$R_{\theta JA}^{a,c}$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	35	$^\circ\text{C/W}$
		Steady State	60	
$R_{\theta JC}^d$	Thermal Resistance-Junction to Case	Steady State	3.5	

Note a : Surface Mounted on 1in^2 pad area, $t \leq 10\text{sec}$.

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J=25^\circ\text{C}$).

Note c : Maximum under Steady State conditions is 75°C/W .

Note d : The power dissipation P_D is based on $T_{J(MAX)} = 150^\circ\text{C}$, and it is useful for reducing junction-to-case thermal resistance ($R_{\theta JC}$) when additional heat sink is used.

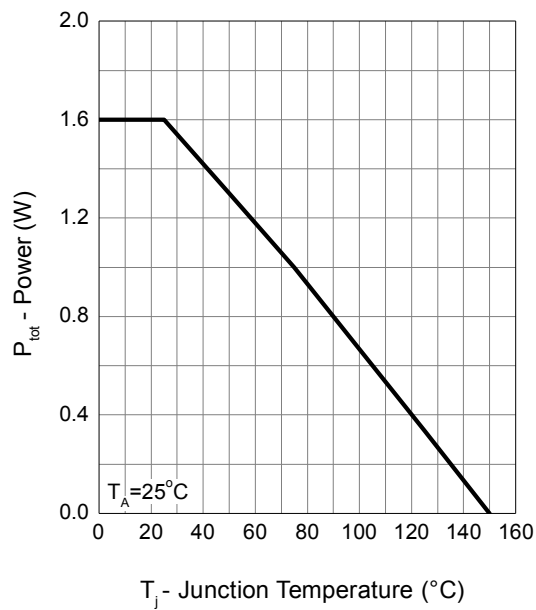
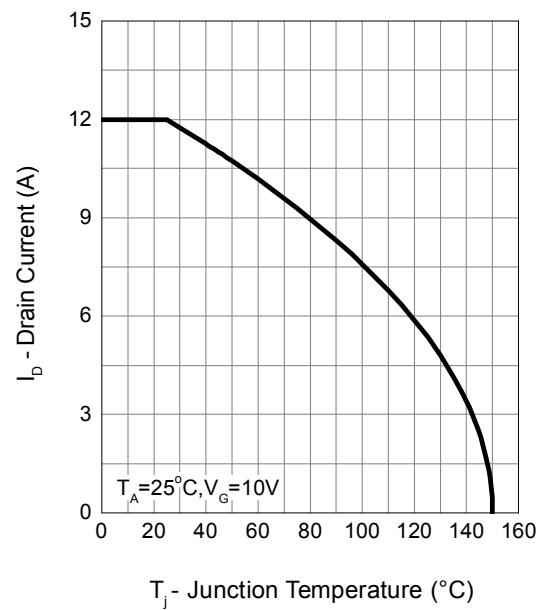
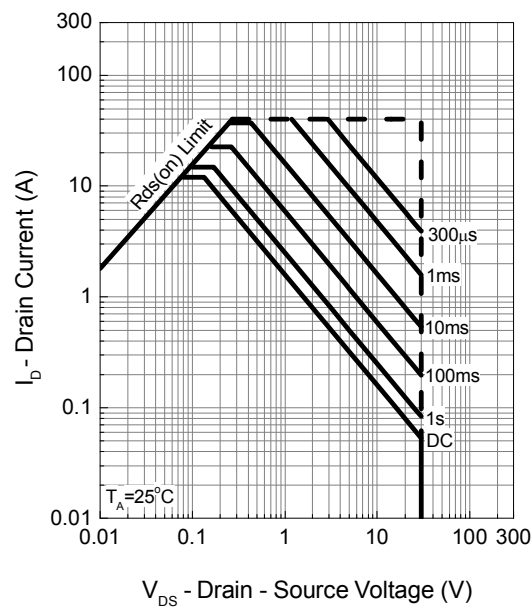
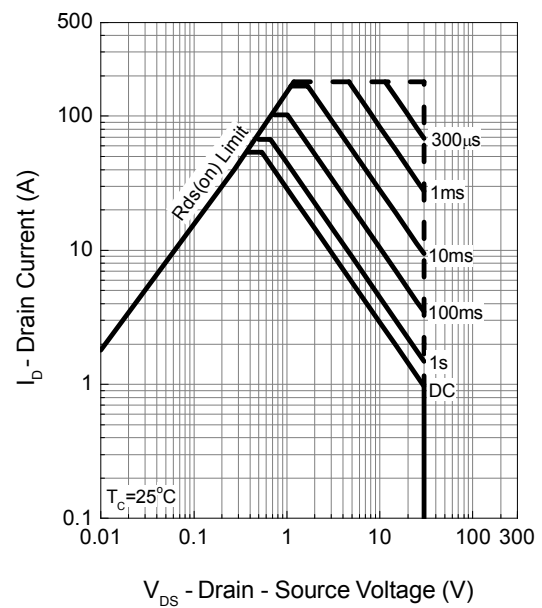
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
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)} ^a	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =12A	-	4.0	5.5	mΩ
		V _{GS} =4.5V, I _{DS} =9A	-	6.3	7.5	
Diode Characteristics						
V _{SD} ^a	Diode Forward Voltage	I _{SD} =2A, V _{GS} =0V	-	0.8	1.1	V
t _{rr} ^b	Reverse Recovery Time	I _{SD} =12A, dI _{SD} /dt=100A/μs	-	10	-	ns
t _a	Charge Time		-	7	-	
t _b	Discharge Time		-	2.7	-	
Q _{rr} ^b	Reverse Recovery Charge		-	3	-	nC
Dynamic Characteristics ^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3	4.5	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	560	1100	1540	pF
C _{oss}	Output Capacitance		185	265	345	
C _{rss}	Reverse Transfer Capacitance		99	105	231	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	14	26	ns
t _r	Turn-on Rise Time		-	10	19	
t _{d(OFF)}	Turn-off Delay Time		-	44	80	
t _f	Turn-off Fall Time		-	12	23	
Gate Charge Characteristics ^b						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =12A	-	28.3	39.6	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =12A	-	12.9	18	
Q _{gth}	Threshold Gate Charge		-	2.46	3.44	
Q _{gs}	Gate-Source Charge		-	4.22	5.9	
Q _{gd}	Gate-Drain Charge		-	7.3	10.2	

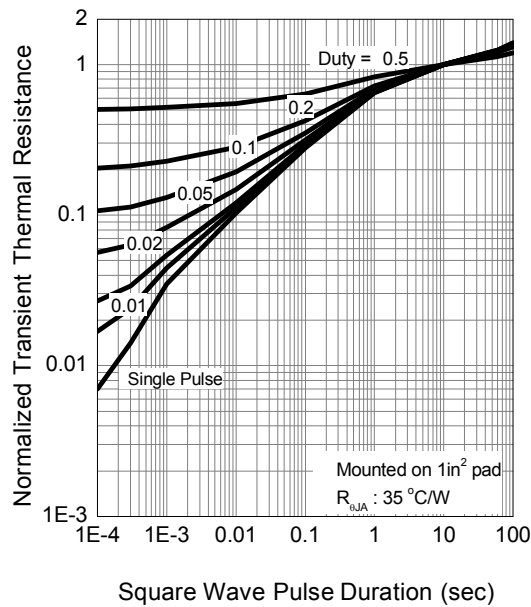
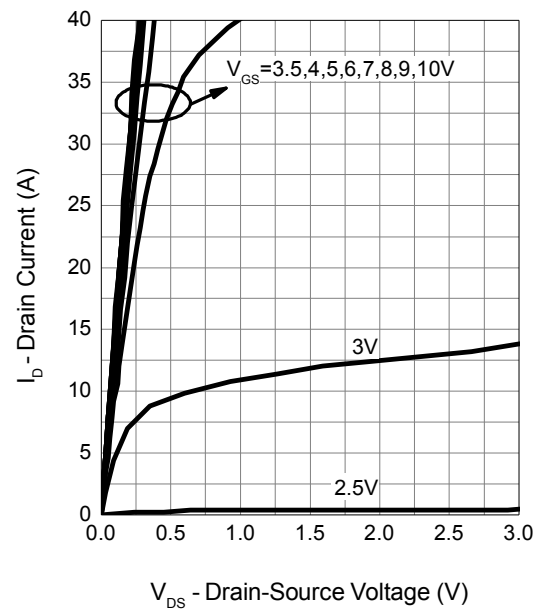
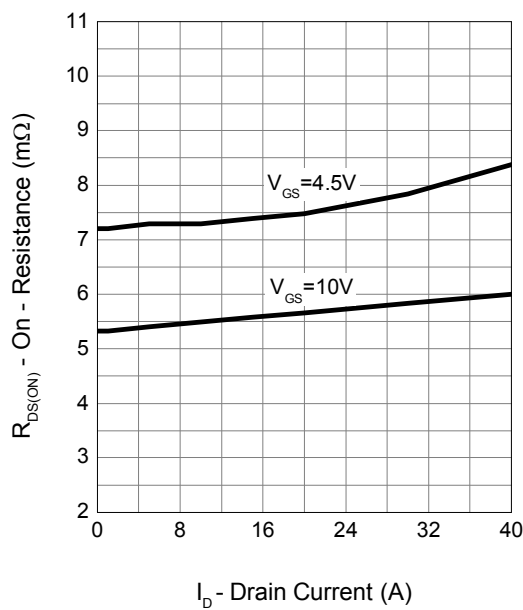
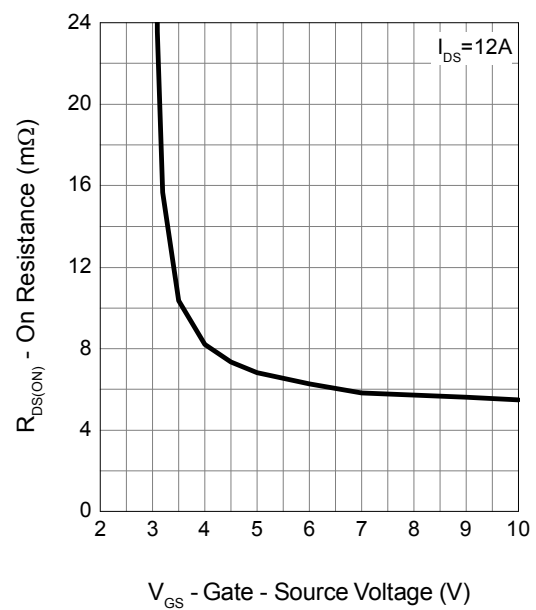
Note a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%.

Note b : Guaranteed by design, not subject to production testing.

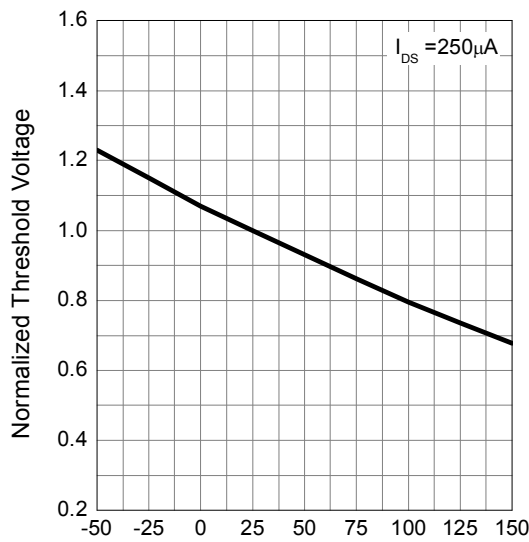
Typical Operating Characteristics

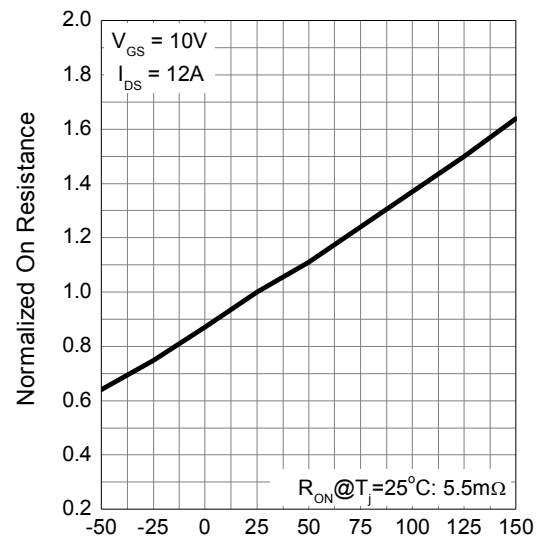
Power Dissipation

Drain Current

Safe Operation Area

Safe Operation Area


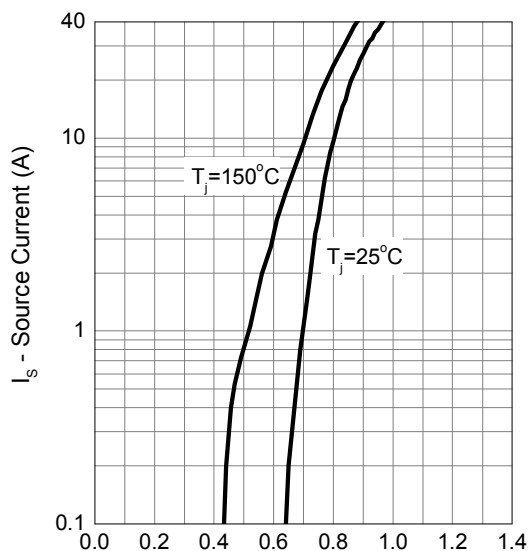
Typical Operating Characteristics (Cont.)

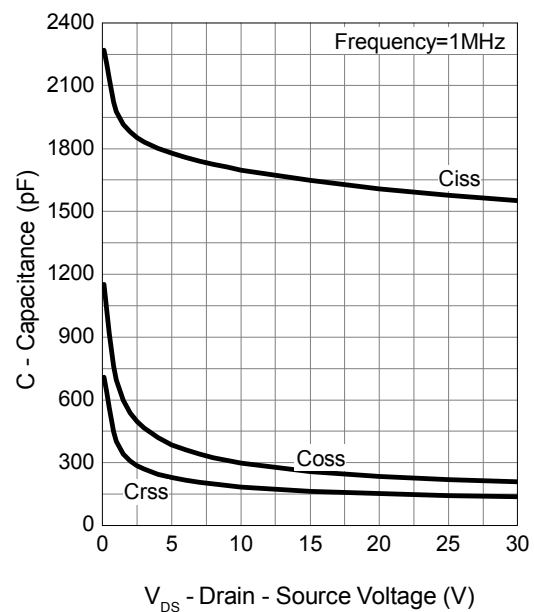
Thermal Transient Impedance

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance


Typical Operating Characteristics (Cont.)

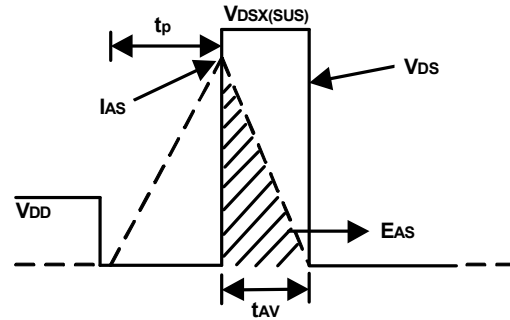
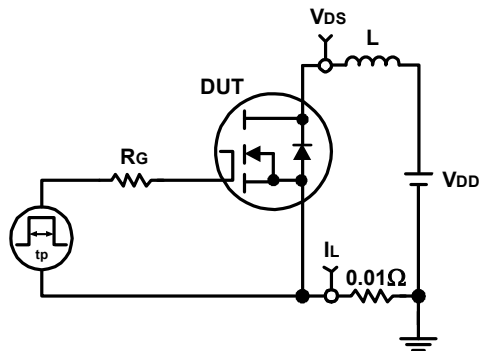
Gate Threshold Voltage

 T_j - Junction Temperature ($^{\circ}\text{C}$)

Drain-Source On Resistance

 T_j - Junction Temperature ($^{\circ}\text{C}$)

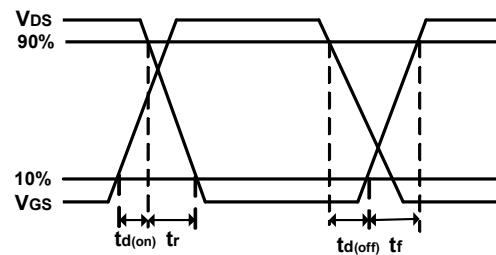
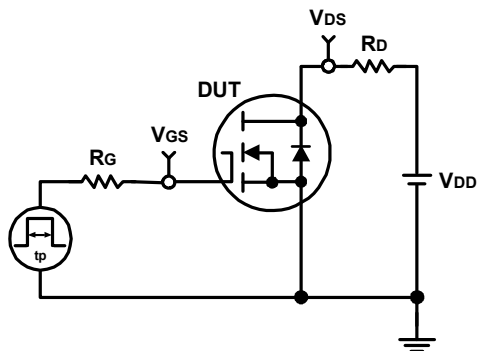
Source-Drain Diode Forward

 V_{SD} - Source - Drain Voltage (V)

Capacitance


Avalanche Test Circuit and Waveforms

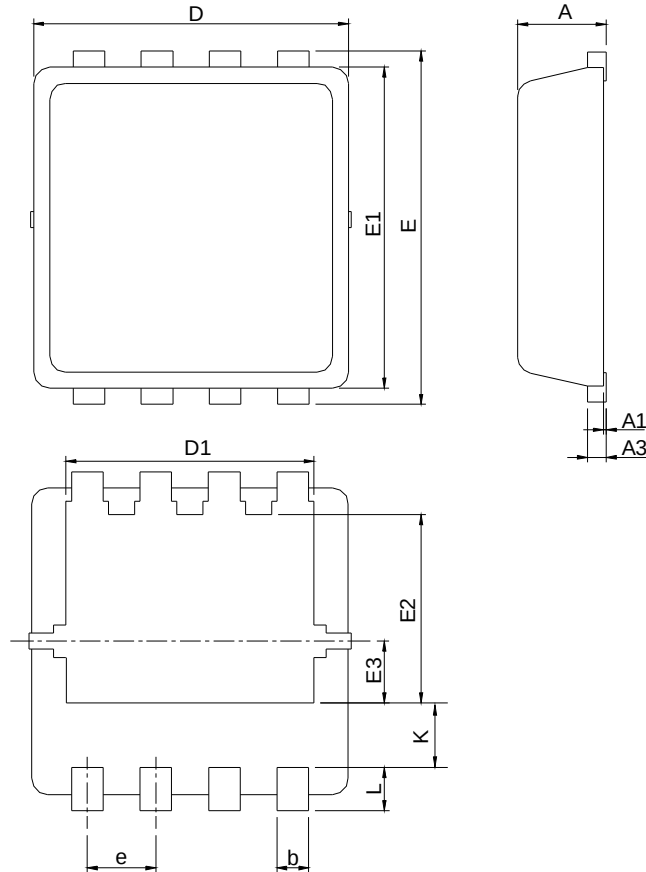


Switching Time Test Circuit and Waveforms



Package Information

PDFN3.3x3.3_8L



SYMBOL	PDFN3x3-8L			
	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

