

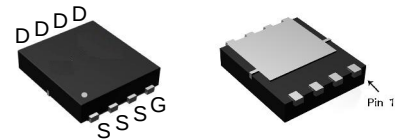
Features

- 30V/58A,
 $R_{DS(ON)} = 2.3m\Omega$ (typ.) @ $V_{GS}=10V$
 $R_{DS(ON)} = 3m\Omega$ (typ.) @ $V_{GS}=4.5V$
- Lower Q_g and Q_{gd} for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

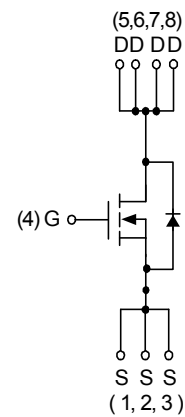
Applications

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

Pin Description



DFN3.3x3.3_8L_EP1_P



N-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ 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	58	A
I _D	Continuous Drain Current	T _C =25°C	58	
		T _C =100°C	23	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	174	A
P _D	Maximum Power Dissipation	T _C =25°C	32.8	W
		T _C =100°C	13.1	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	3.8	°C/W
I _D ^b	Continuous Drain Current	T _A =25°C	18.1	A
		T _A =70°C	14.5	
P _D ^b	Maximum Power Dissipation	T _A =25°C	1.78	W
		T _A =70°C	1.14	
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	t ≤ 10s	40	°C/W
		Steady State	70	
I _{AS} ^c	Avalanche Current, Single pulse	L=0.1mH	35	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.1mH	61.25	mJ

Note a : Pulse width is limited by max. junction temperature.

Note b : Surface Mounted on 1in^2 pad area, $t \leq 999\text{sec}$.

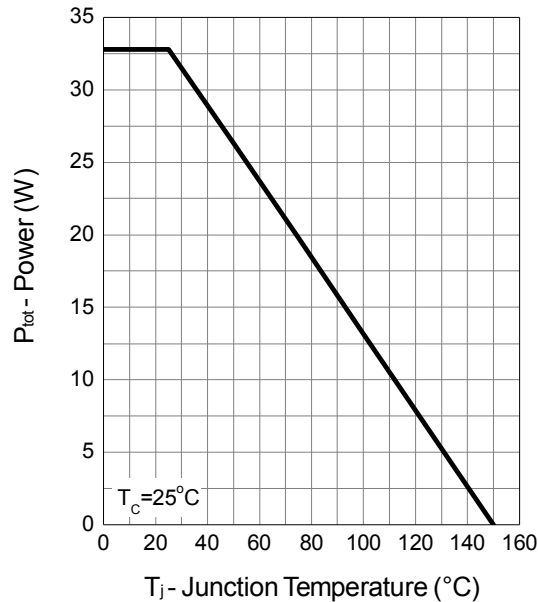
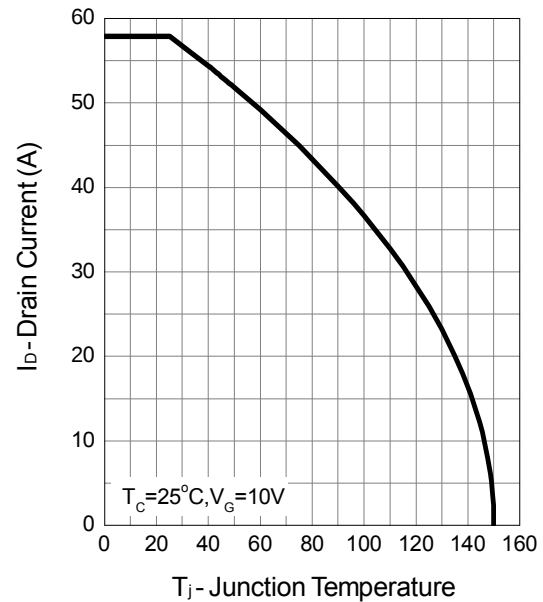
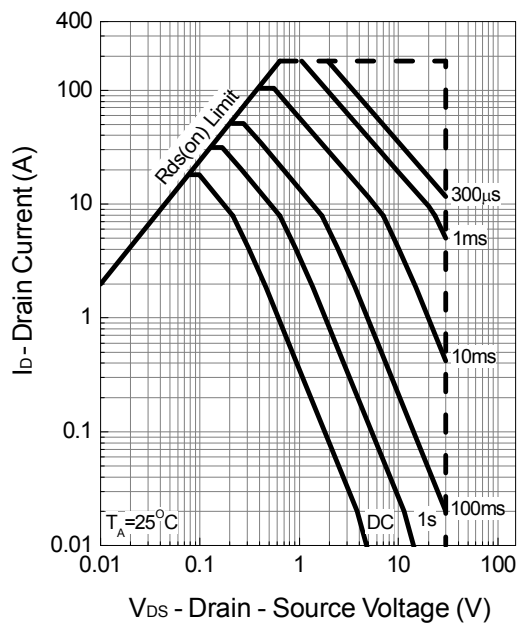
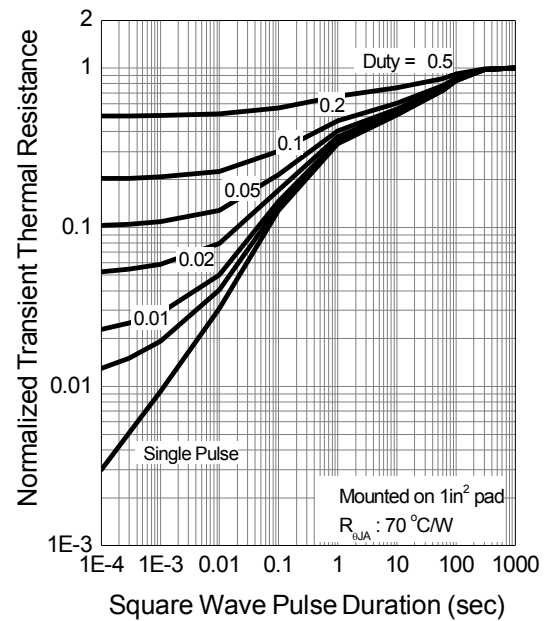
Note c : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

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

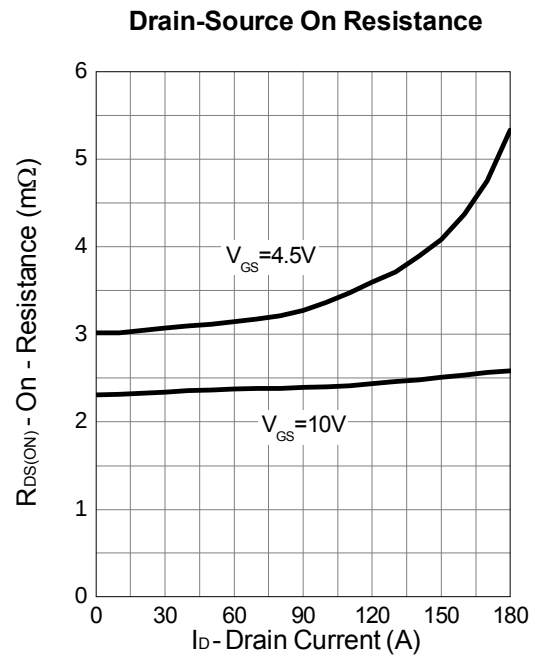
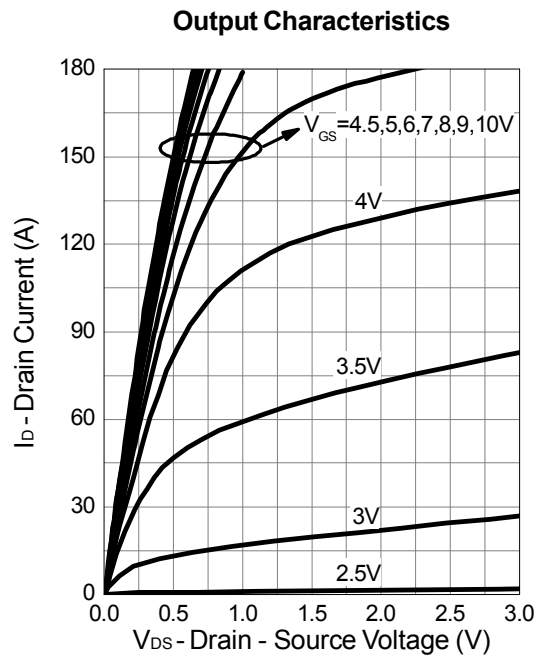
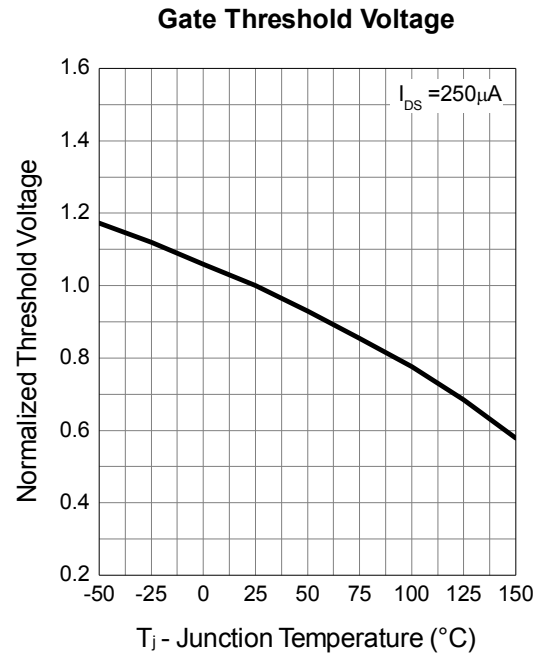
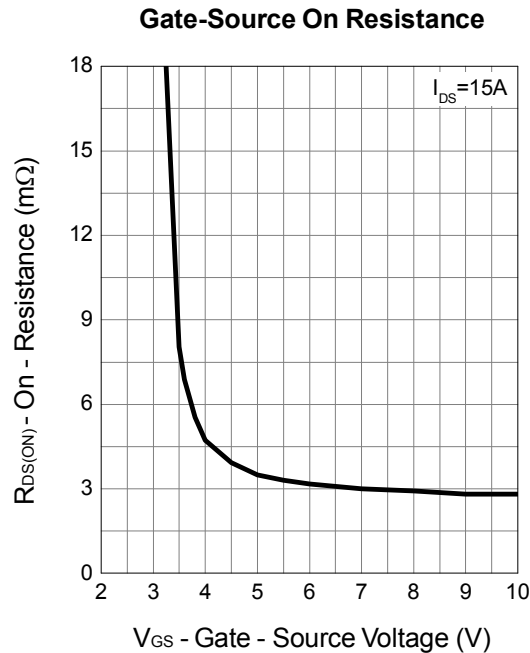
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
BV _{DSS} t	Drain-Source Breakdown Voltage (transient)	V _{GS} =0V, I _{D(aval)} =35A T _{case} =25°C, t _{transient} =100ns	34	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V T _J =85°C	- -	- -	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.5	3.0	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} =15A T _J =125°C	- -	2.3 3.35	3.3 -	mΩ
		V _{GS} =4.5V, I _{DS} =10A	-	3	4.3	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =10A	-	20	-	S
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.77	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =5A, dI _{SD} /dt=100A/μs, V _{dd} =15V	-	40	-	ns
t _a	Charge Time		-	20	-	
t _b	Discharge Time		-	20	-	
Q _{rr}	Reverse Recovery Charge		-	33	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	0.8	1.8	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	3020	-	pF
C _{oss}	Output Capacitance		-	400	-	
C _{rss}	Reverse Transfer Capacitance		-	306	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =1Ω	-	15	-	ns
t _r	Turn-on Rise Time		-	12	-	
t _{d(OFF)}	Turn-off Delay Time		-	28	-	
t _f	Turn-off Fall Time		-	32	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =15A	-	28	37	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =15A	-	13.4	-	
Q _{gth}	Threshold Gate Charge		-	2.5	-	
Q _{gs}	Gate-Source Charge		-	4	-	
Q _{gd}	Gate-Drain Charge		-	4.5	-	

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

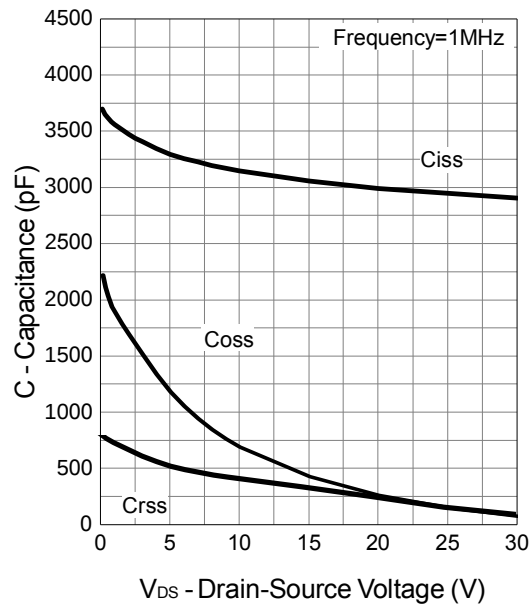
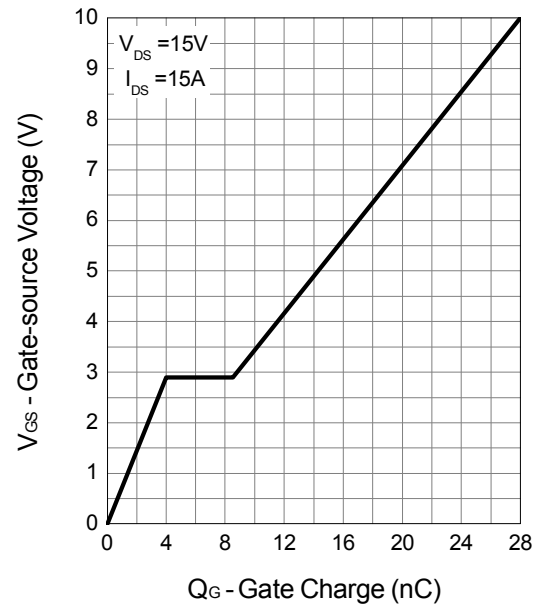
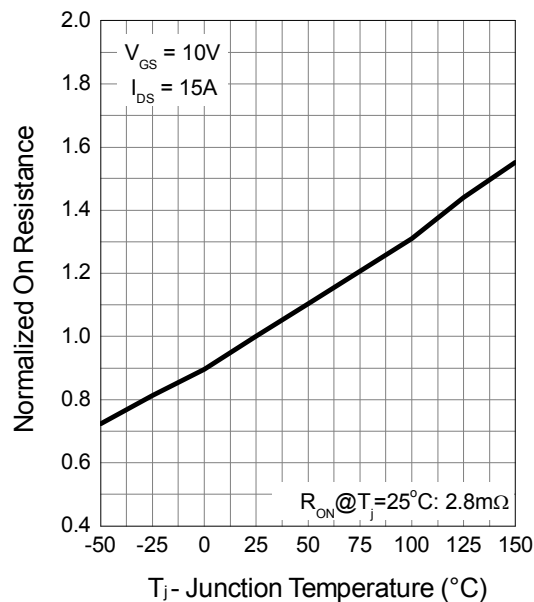
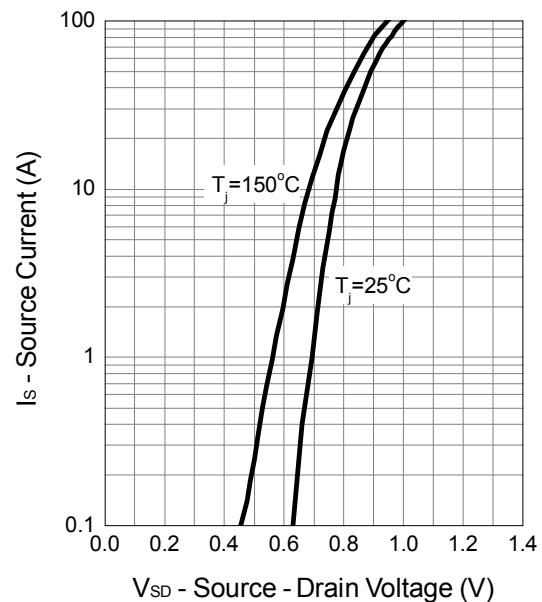
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


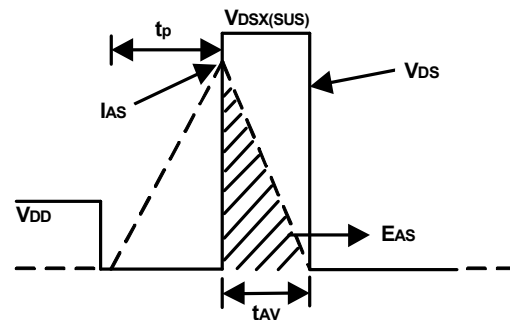
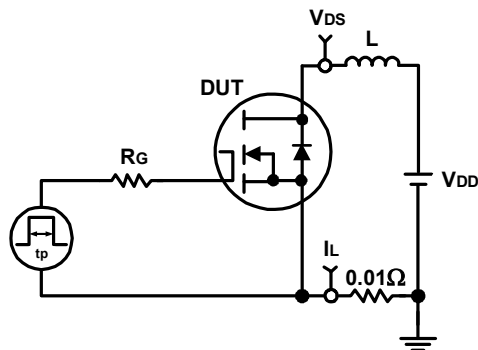
Typical Operating Characteristics (Cont.)



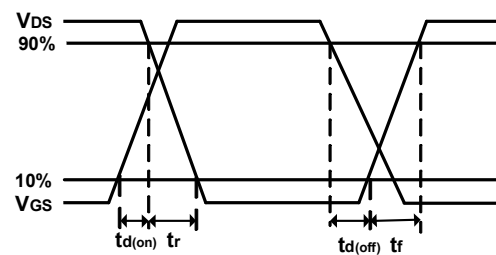
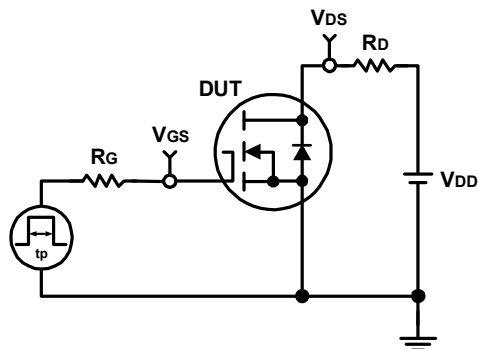
Typical Operating Characteristics (Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


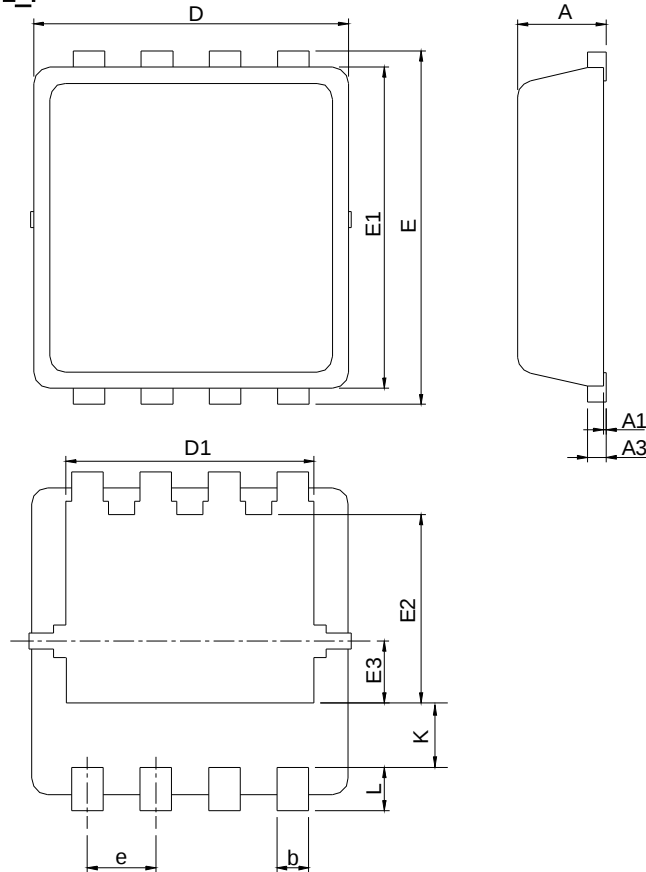
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Package Information

DFN3.3x3.3_8L_EP1_P


SYMBOL	DFN3x3-8			
	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

