

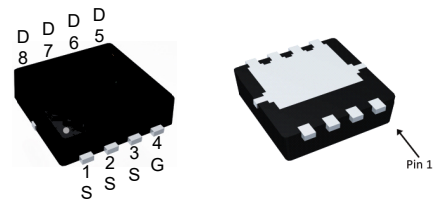
Features

- 20V/90A
 $R_{DS(ON)}=3.5m\Omega(typ.)@V_{GS}=4.5V$
 $R_{DS(ON)}=5m\Omega(typ.)@V_{GS}=2.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

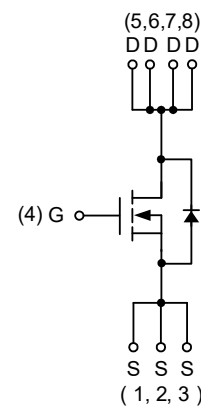
Applications

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

Pin Description



DFN3.3x3.3A-8_EP



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		20	V
V _{GSS}	Gate-Source Voltage		±12	
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	90	A
I _D	Continuous Drain Current	T _C =25°C	90	A
		T _C =100°C	68	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	270	
P _D	Maximum Power Dissipation	T _C =25°C	38	W
		T _C =100°C	15	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	3.3	°C/W
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤10s	28	°C/W
		Steady State	80	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	26	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	33.8	mJ

Note a : Maximum continuous current is limited by bonding wire.

Note b : Pulse width limited by maximum junction temperature.

Note c : Surface mounted on 1in^2 pad area, steady state $t = 999\text{s}$.

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

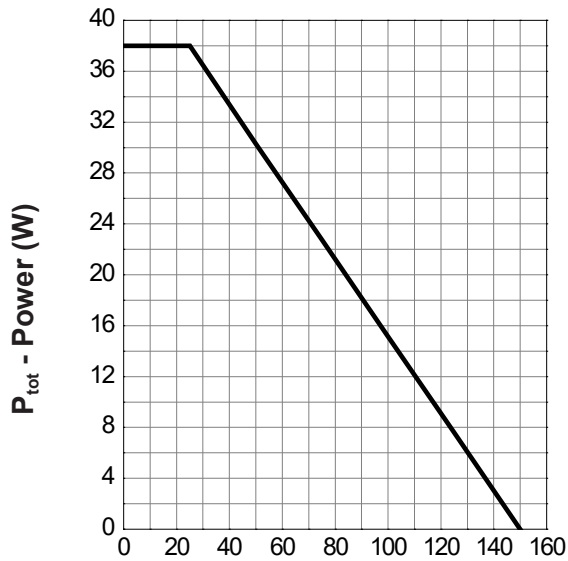
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

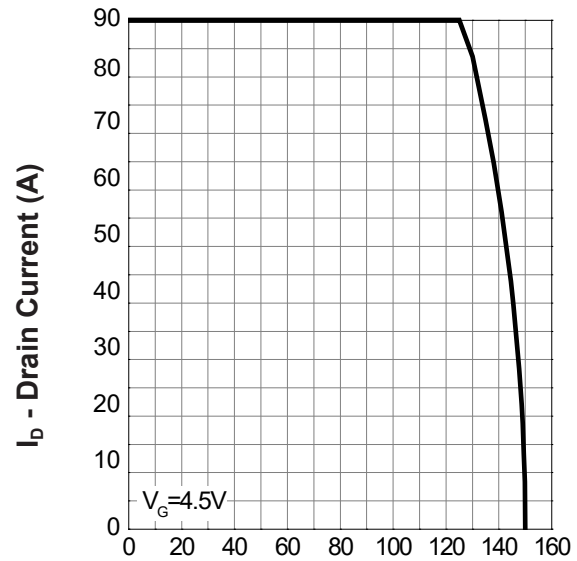
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.5	0.75	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =12A	-	3.5	4.5	mΩ
		V _{GS} =2.5V, I _{DS} =7.2A	-	5	6.5	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =7.2A	-	22	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.7	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =12A, dI _{SD} /dt=100A/μs	-	20	-	ns
t _a	Charge Time		-	11	-	
t _b	Discharge Time		-	9	-	
Q _{rr}	Reverse Recovery Charge		-	10	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.1	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	2440	3172	pF
C _{oss}	Output Capacitance		-	380	-	
C _{rss}	Reverse Transfer Capacitance		-	270	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =4.5V, R _G =6Ω	-	13	24	ns
t _r	Turn-on Rise Time		-	13.2	24	
t _{d(OFF)}	Turn-off Delay Time		-	93	168	
t _f	Turn-off Fall Time		-	51	92	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =12A	-	25	-	nC
Q _{gth}	Threshold Gate Charge		-	1.8	2.3	
Q _{gs}	Gate-Source Charge		-	3.7	4.8	
Q _{gd}	Gate-Drain Charge		-	6.6	9.9	

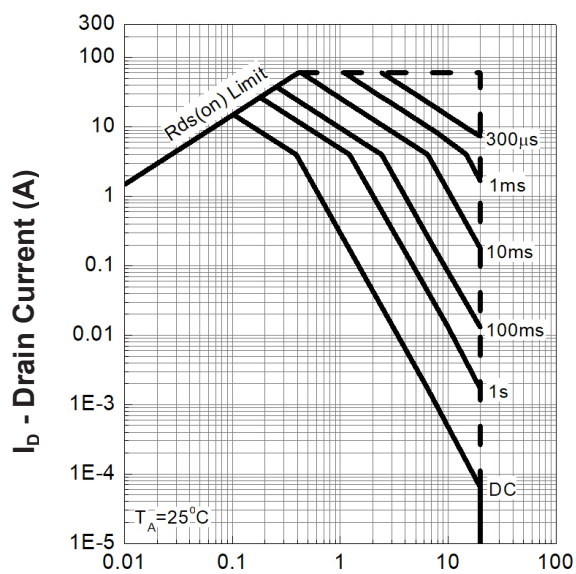
Note e : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

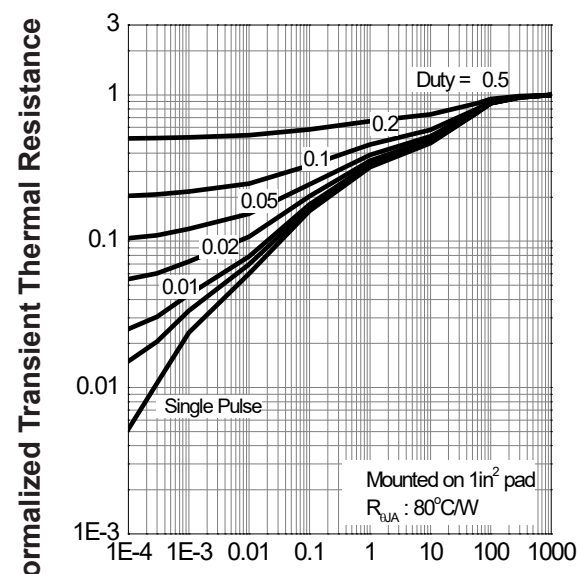
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

Power Dissipation

 T_c - Case Temperature (°C)

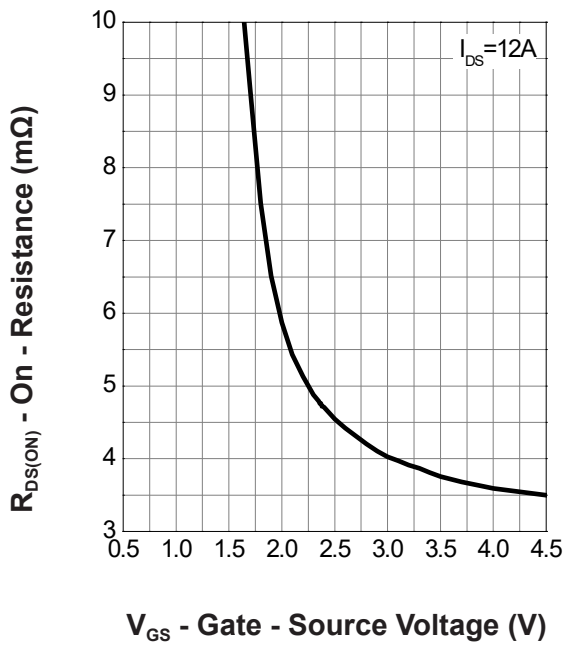
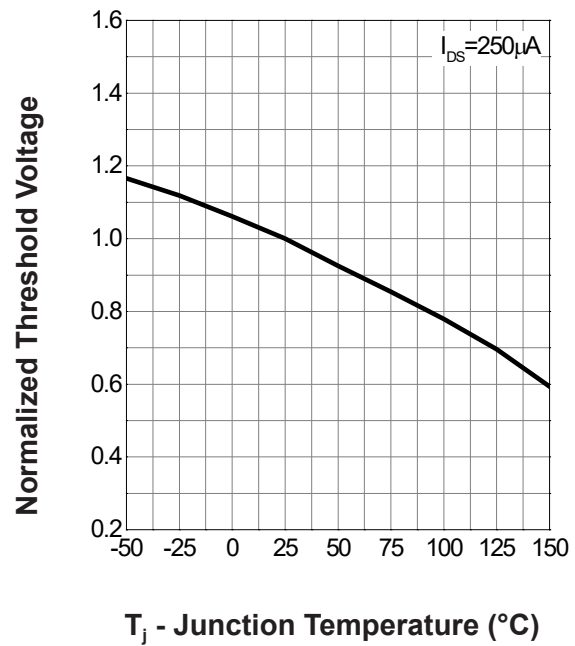
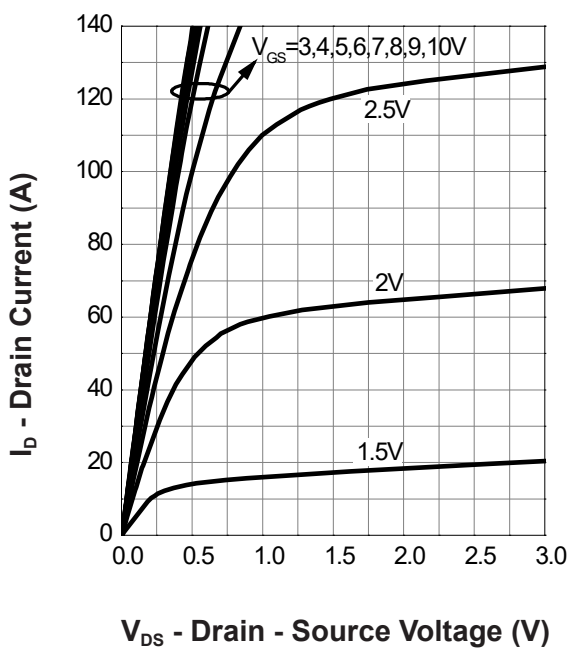
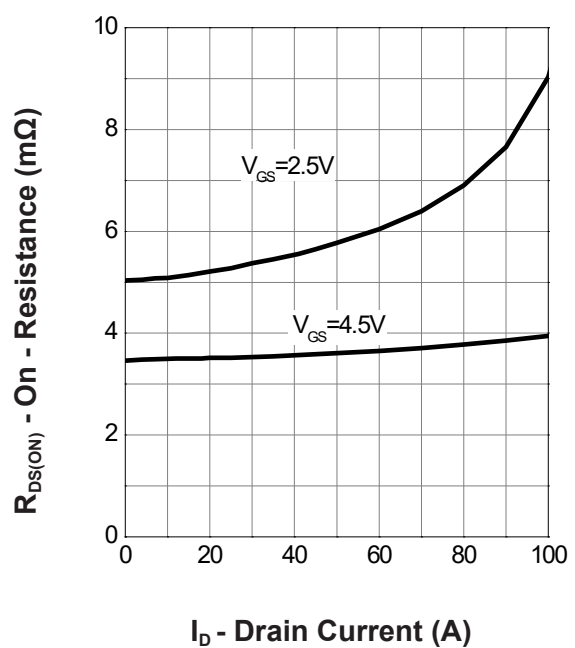
Drain Current

 T_c - Case Temperature (°C)

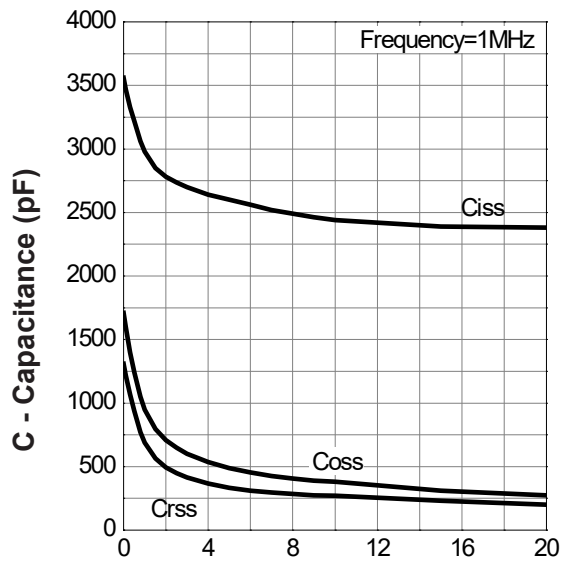
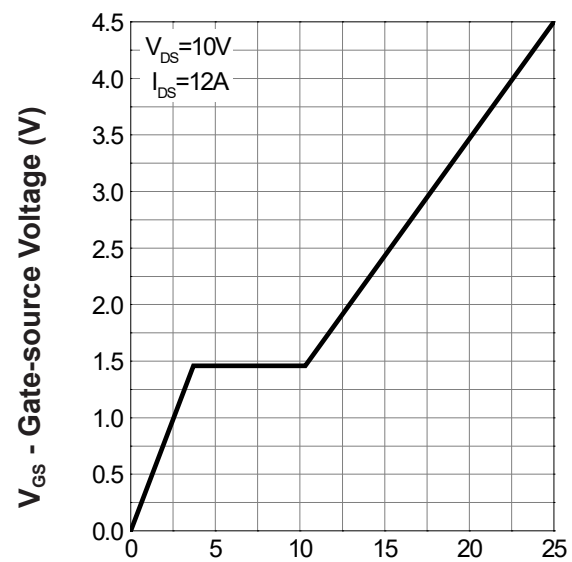
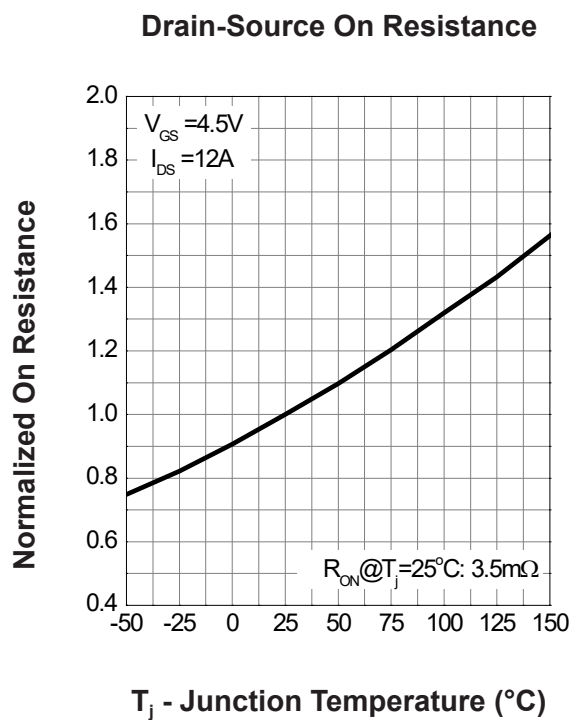
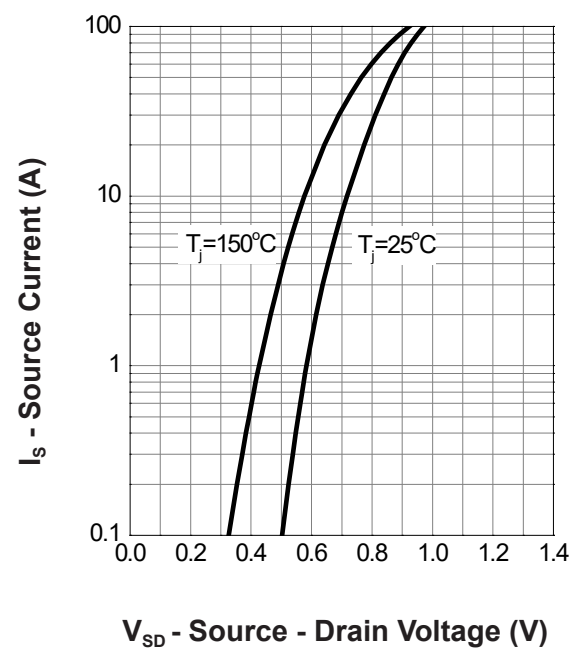
Safe Operation Area

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

Thermal Transient Impedance


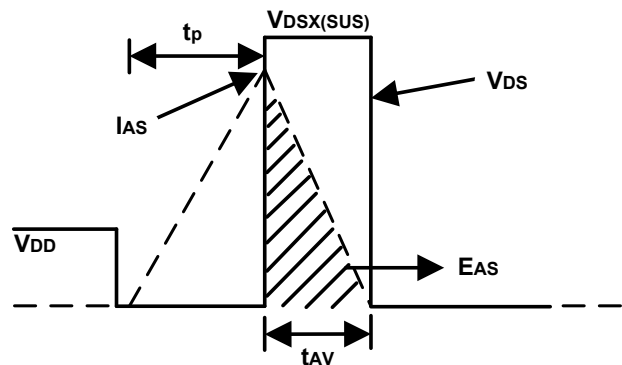
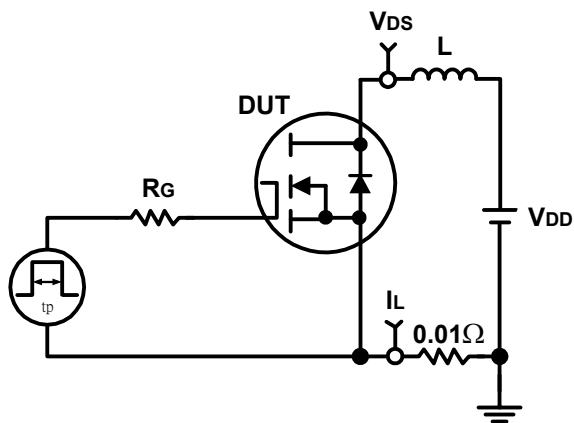
Square Wave Pulse Duration (sec)

Typical Operating Characteristics(Cont.)

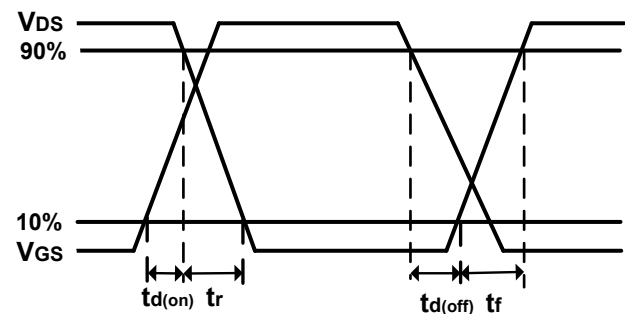
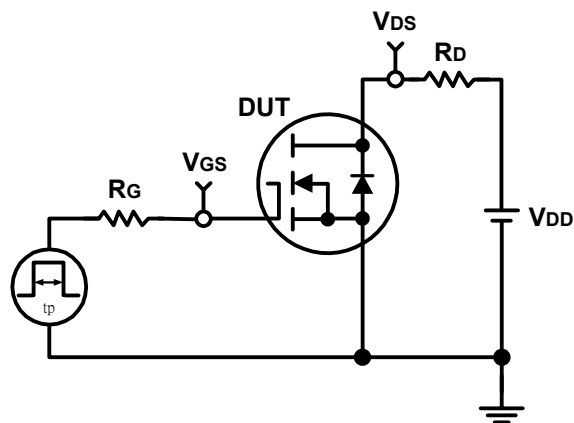
Gate-Source On Resistance

Gate Threshold Voltage

Output Characteristics

Drain-Source On Resistance


Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

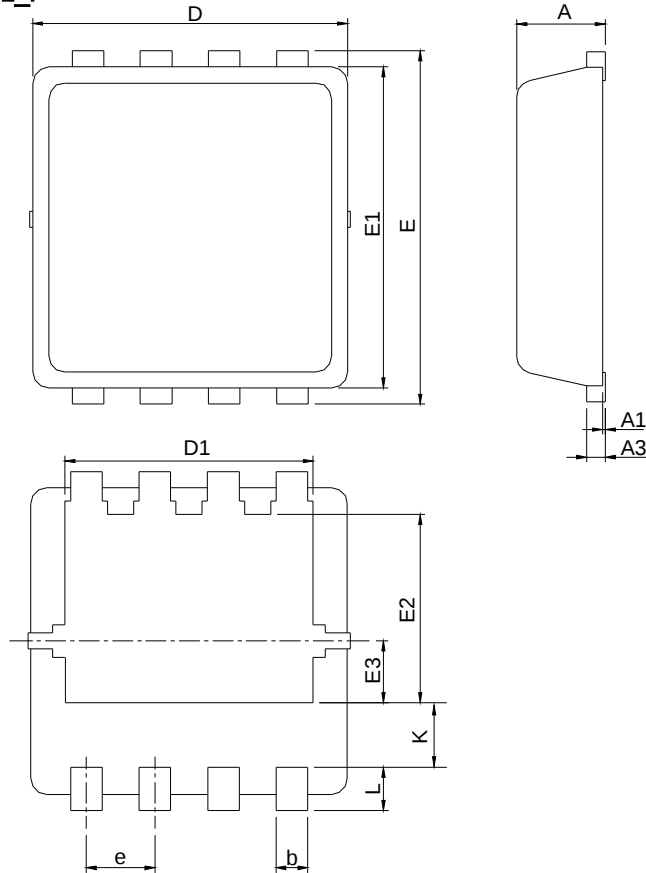


Switching Time Test Circuit and Waveforms



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

