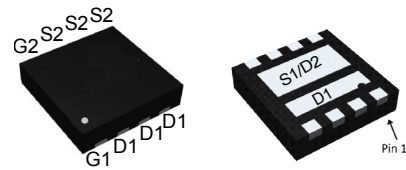


Features

- 20V/12A
 $R_{DS(ON)}=8m\Omega(\text{typ.})@V_{GS}=4.5V$
 $R_{DS(ON)}=10m\Omega(\text{typ.})@V_{GS}=2.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

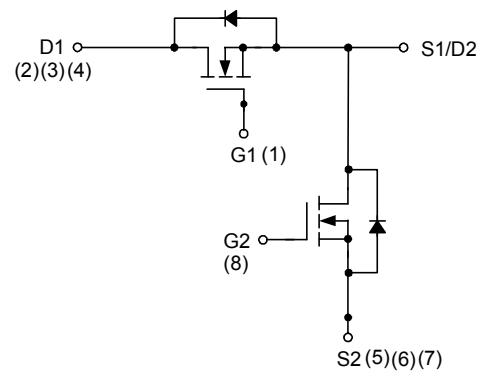
Pin Description



TDFN3x3-8_EP2

Applications

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



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	12	A
I _D	Continuous Drain Current	T _C =25°C	12	A
		T _C =100°C	4.8	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	36	A
P _D	Maximum Power Dissipation	T _C =25°C	18	W
		T _C =100°C	7	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	7	°C/W
I _D	Continuous Drain Current	T _A =25°C	8	A
		T _A =70°C	6	
I _{DM} ^b	Pulsed Drain Current	T _A =25°C	32	A
P _D	Maximum Power Dissipation	T _A =25°C	1.6	W
		T _A =70°C	1	
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	43	°C/W
		Steady State	80	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	9	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	4.1	mJ

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

Note b : Pulse width is 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 $T_J=25^{\circ}\text{C}$).

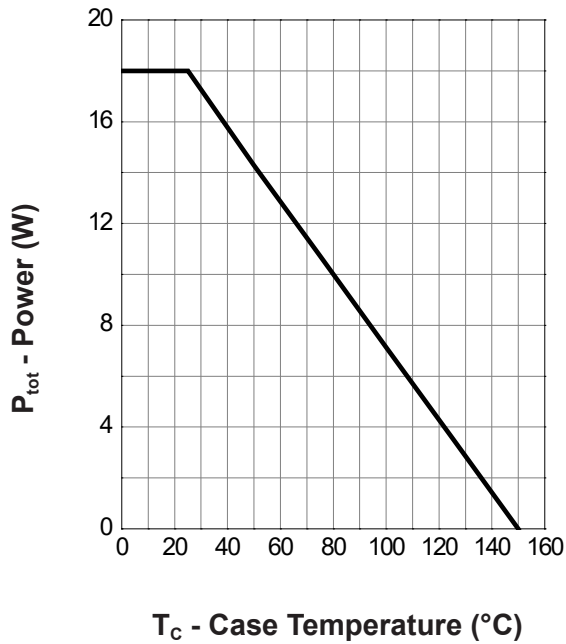
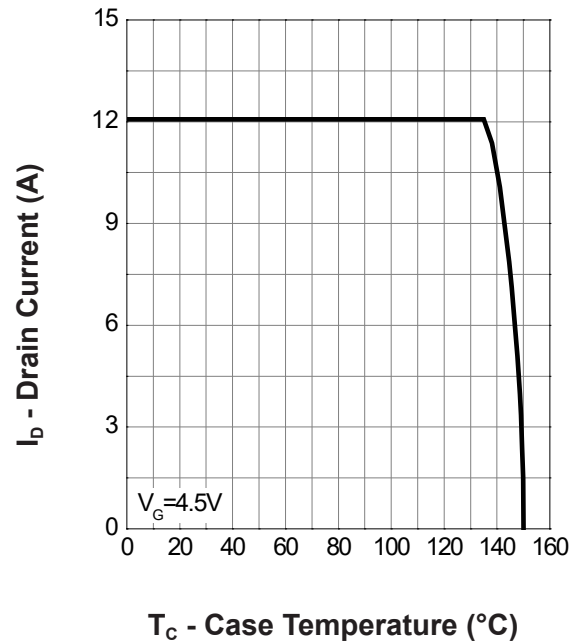
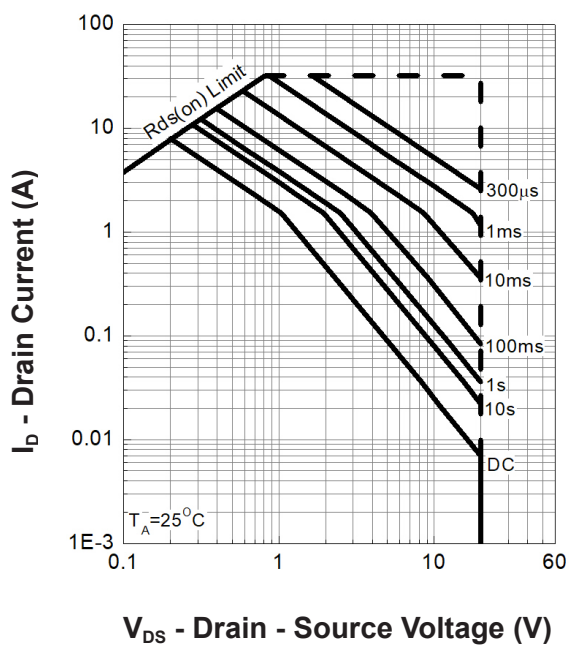
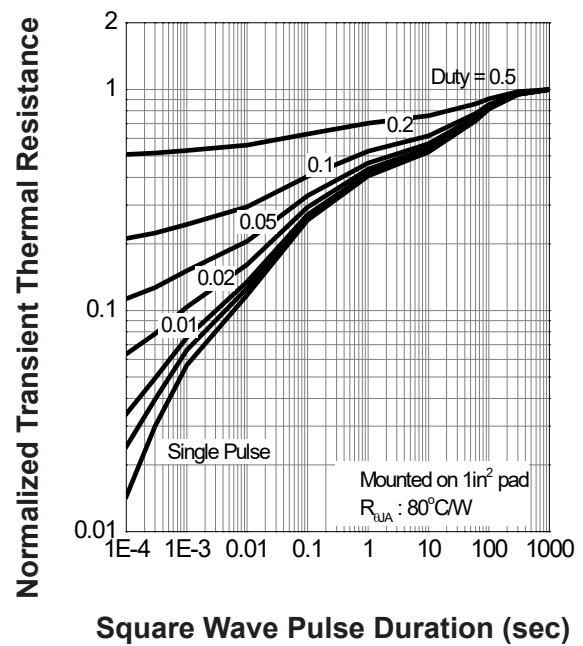
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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 T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.4	0.75	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =4.5V, I _{DS} =4A T _J =125°C V _{GS} =2.5V, I _{DS} =3A	- - -	8 11 10	11 - 14	mΩ
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =5A	-	10	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =2A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =4A, dI _{SD} /dt=100A/μs	-	4.8	-	ns
t _a	Charge Time		-	4	-	
t _b	Discharge Time		-	8.8	-	
Q _{rr}	Reverse Recovery Charge		-	3.2	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	2	4	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	900	1297	pF
C _{oss}	Output Capacitance		-	196	-	
C _{rss}	Reverse Transfer Capacitance		-	89	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =4.5V, R _G =6Ω	-	4	8	ns
t _r	Turn-on Rise Time		-	13	24	
t _{d(OFF)}	Turn-off Delay Time		-	22	40	
t _f	Turn-off Fall Time		-	5	9	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =10V, I _{DS} =4A	-	12	17	nC
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =4A	-	6.2	-	
Q _{gth}	Threshold Gate Charge		-	0.3	-	
Q _{gs}	Gate-Source Charge		-	0.6	-	
Q _{gd}	Gate-Drain Charge		-	2	-	

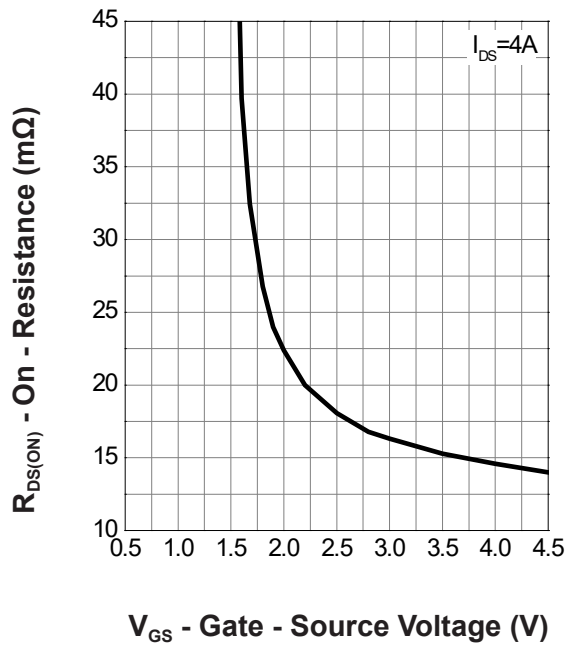
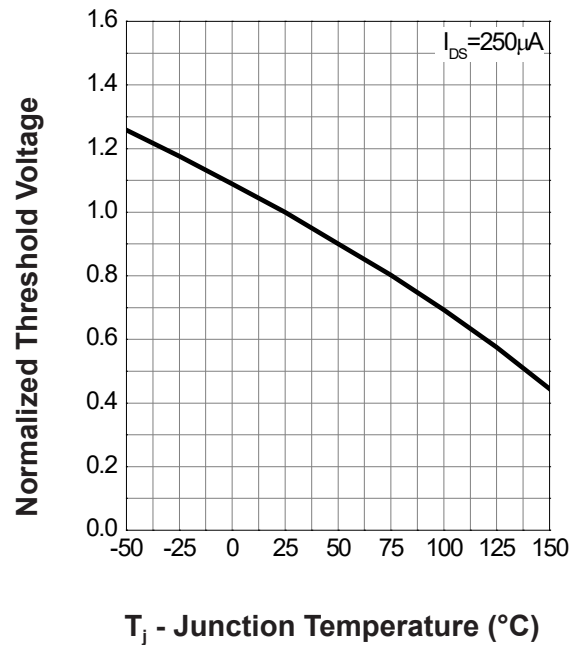
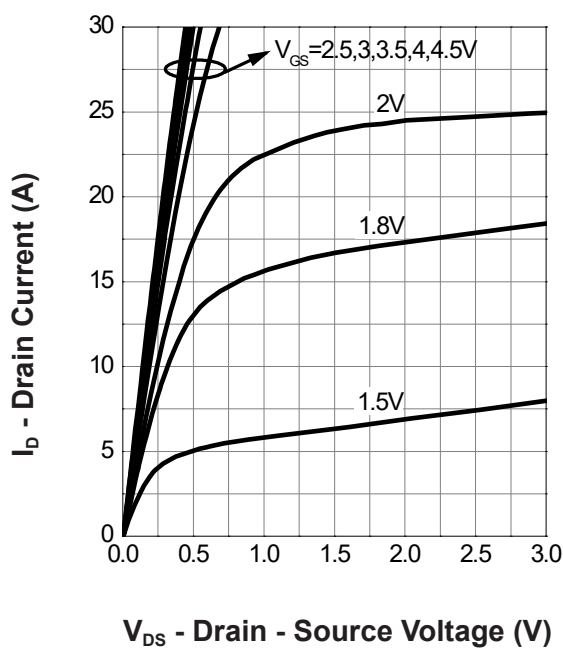
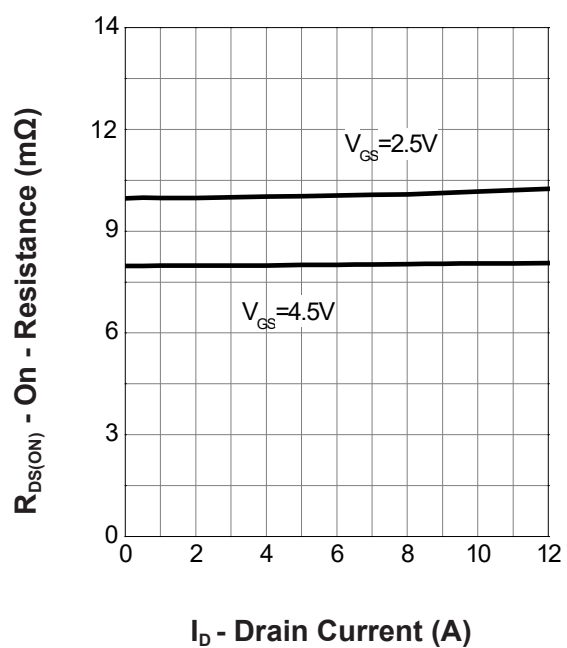
Note e : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

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

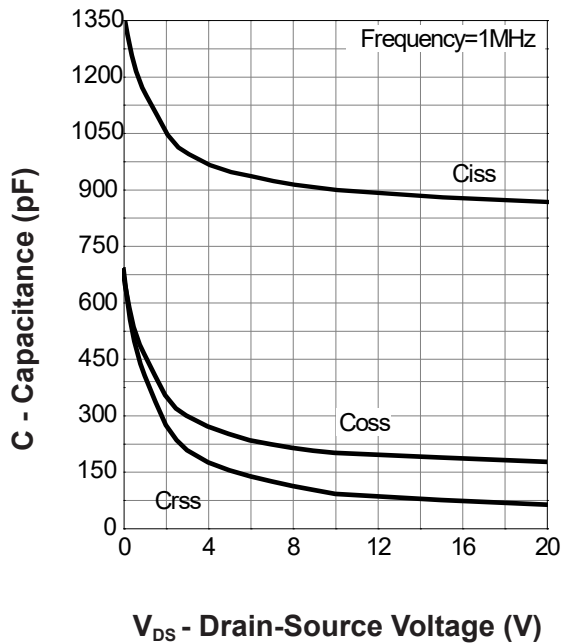
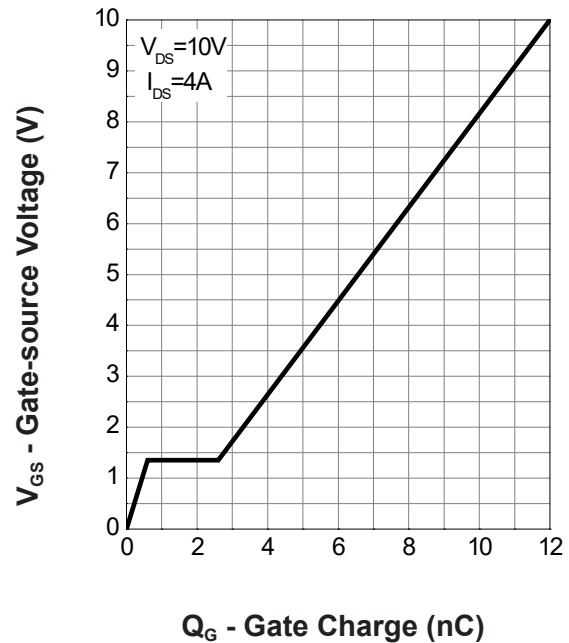
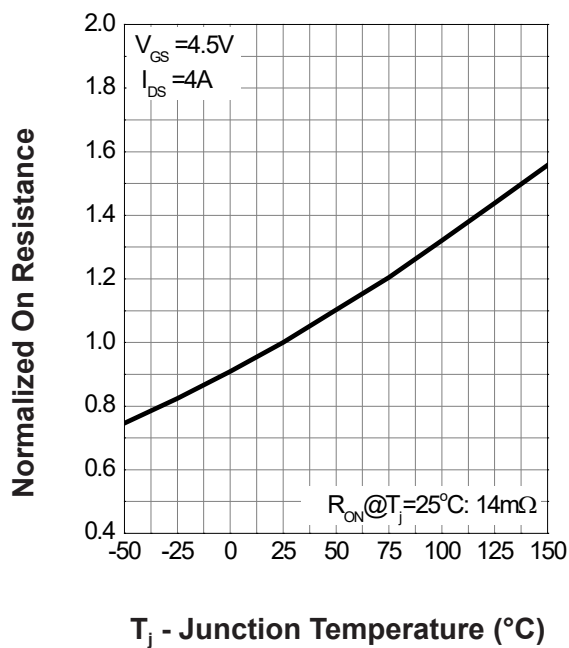
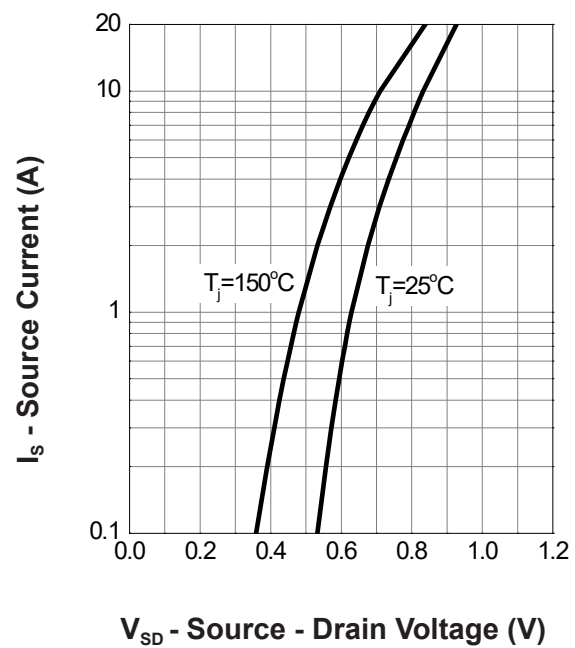
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


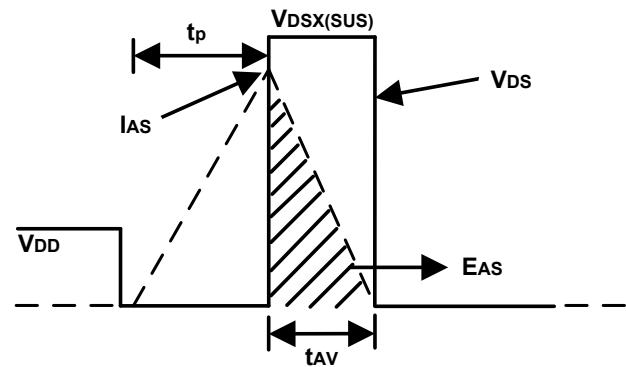
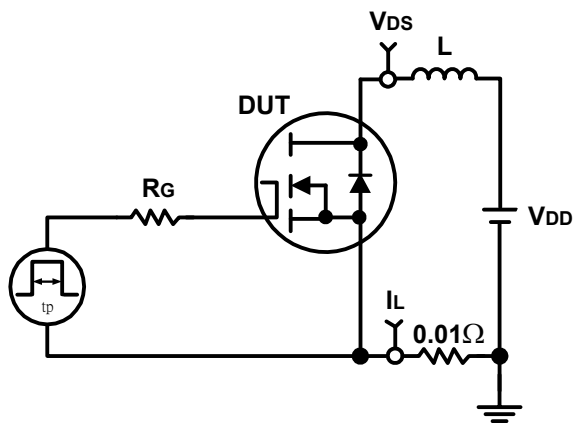
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance

Gate Threshold Voltage

Output Characteristics

Drain-Source On Resistance


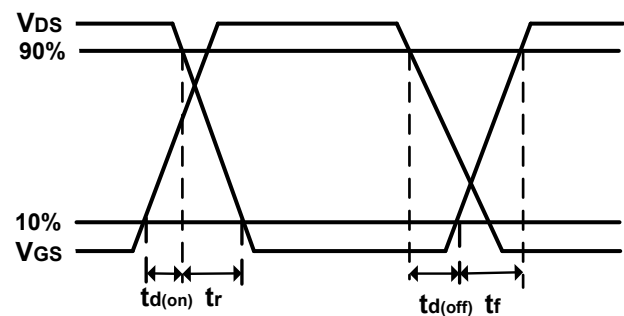
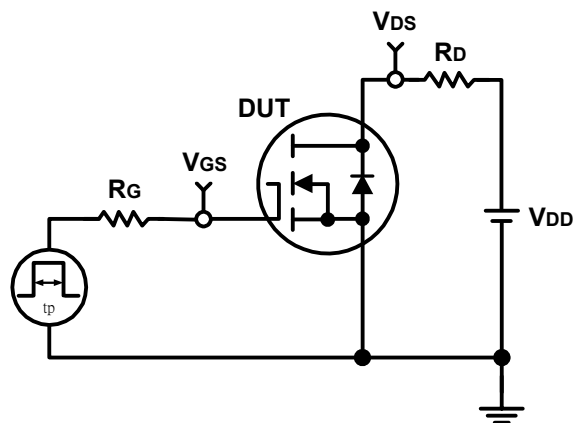
Typical Operating Characteristics(Cont.)

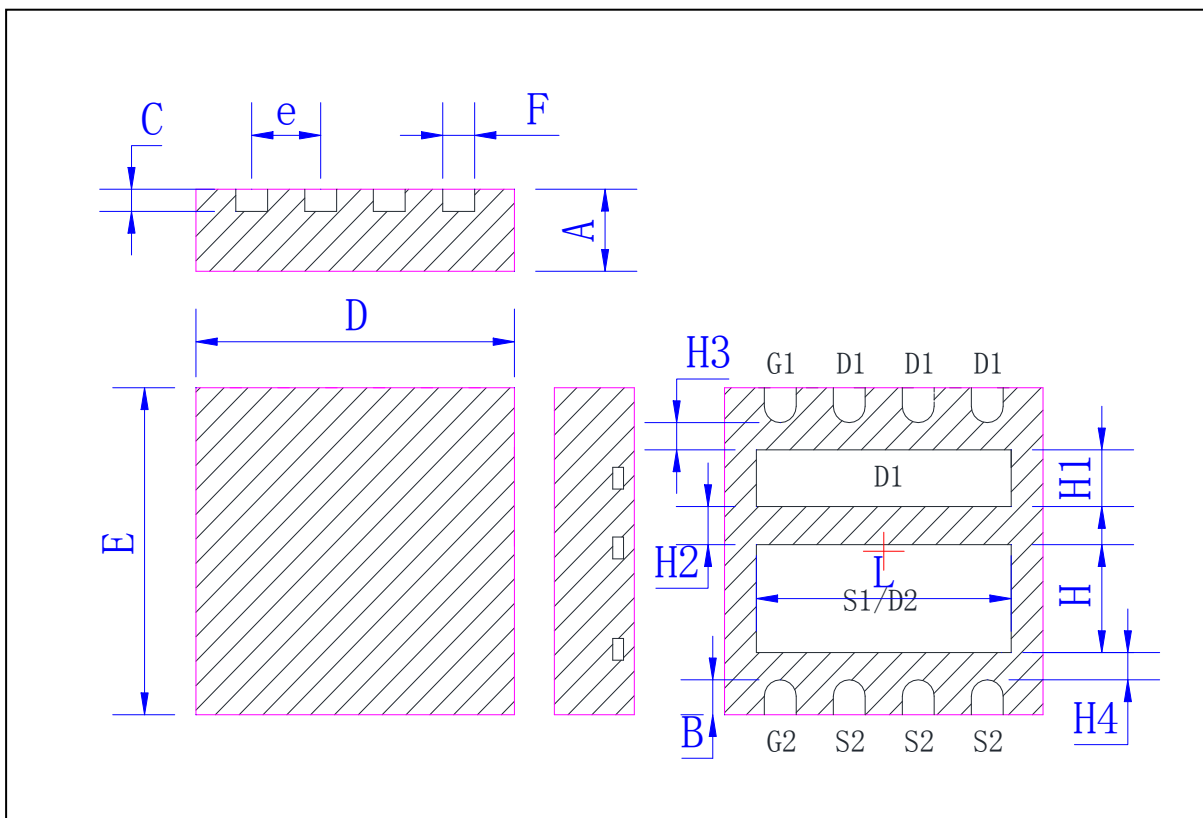
Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



TDFN3*3-8_EP2 OUTLINE


Symbol	Min	Typ	Max
A	0.70	0.75	0.80
B	0.27	0.32	0.37
C	0.153	0.203	0.253
D	2.90	3.00	3.10
E	2.90	3.00	3.10
e	0.60	0.65	0.70
F	0.25	0.30	0.35
H	0.89	0.99	1.09
H1	0.42	0.52	0.62
H2	0.25	0.35	0.45
H3	0.15	0.25	0.35
H4	0.15	0.25	0.35
L	2.30	2.40	2.50