

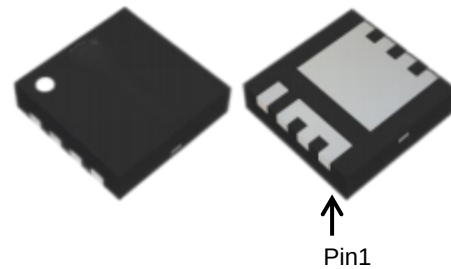
Features

- 20V/100A
 $R_{DS(ON)}=1.3m\Omega(typ.)@V_{GS}=4.5V$
 $R_{DS(ON)}=1.7m\Omega(typ.)@V_{GS}=2.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

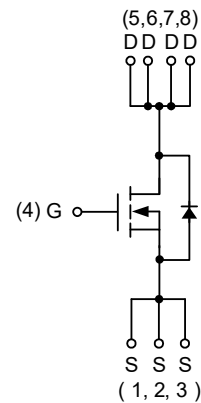
Applications

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

Pin Description



SDFN3333B



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	100	A
I _D	Continuous Drain Current	T _C =25°C	100	A
		T _C =100°C	75	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	300	
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 $T_J=25^{\circ}\text{C}$).

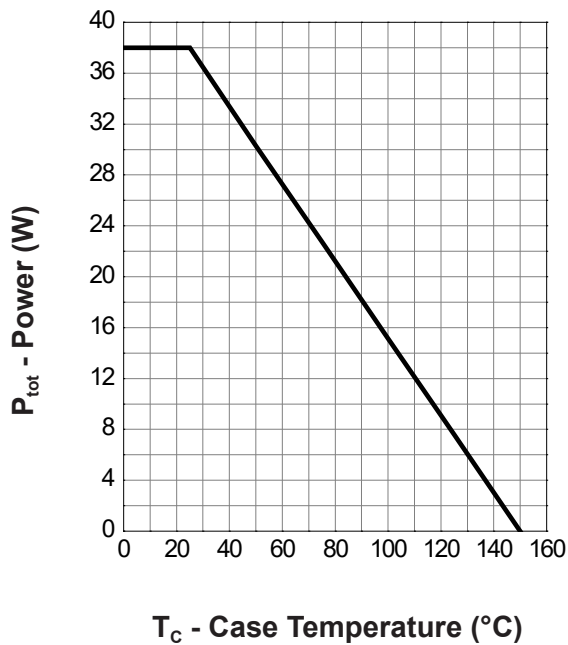
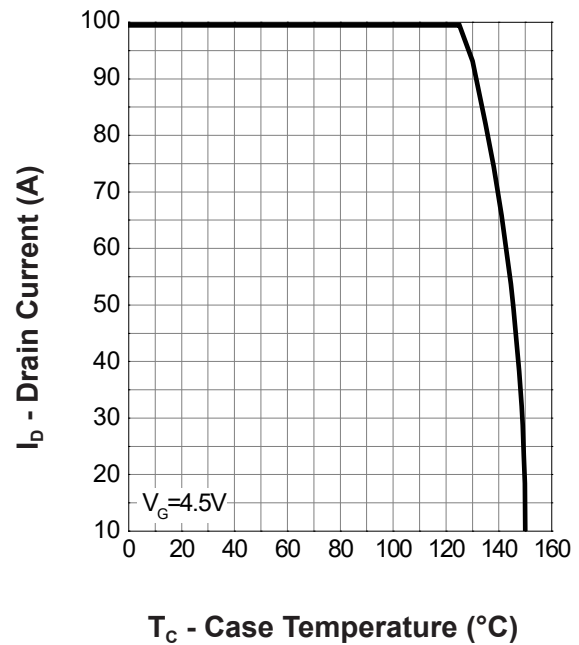
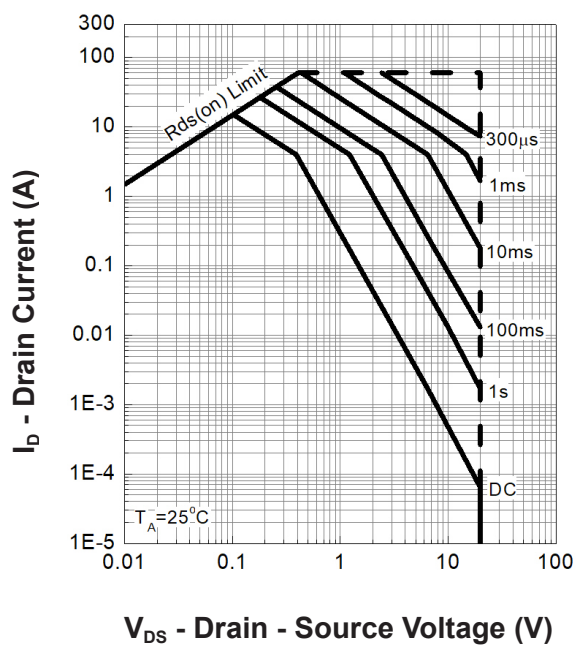
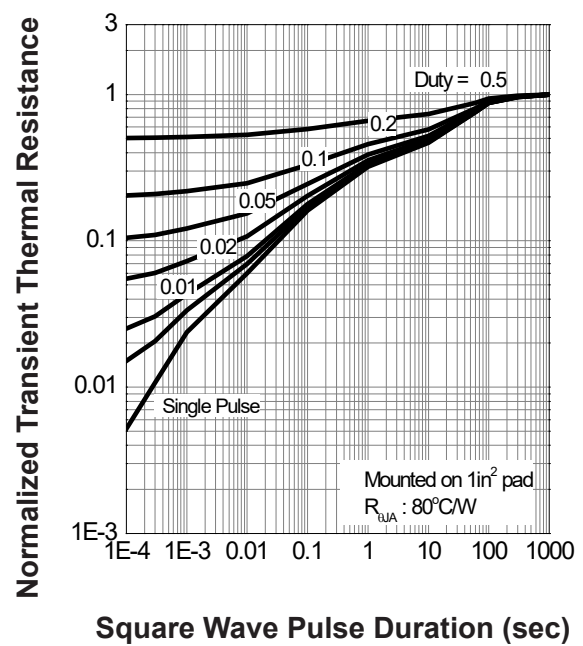
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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	-	1.3	1.9	mΩ
		V _{GS} =2.5V, I _{DS} =7.2A	-	1.7	2.5	
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 $\leq 2\%$.

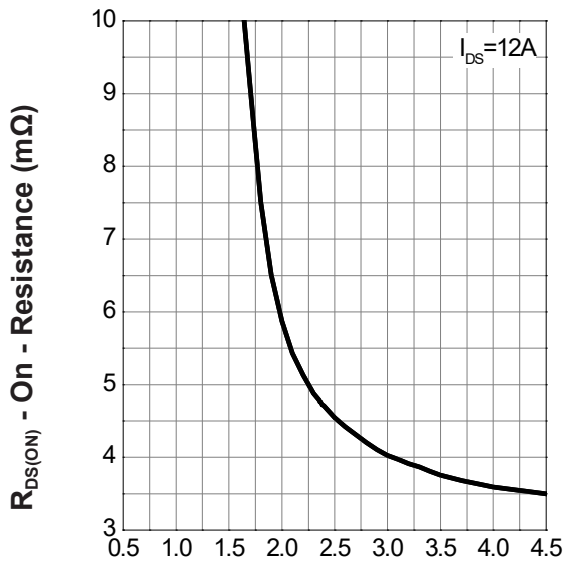
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


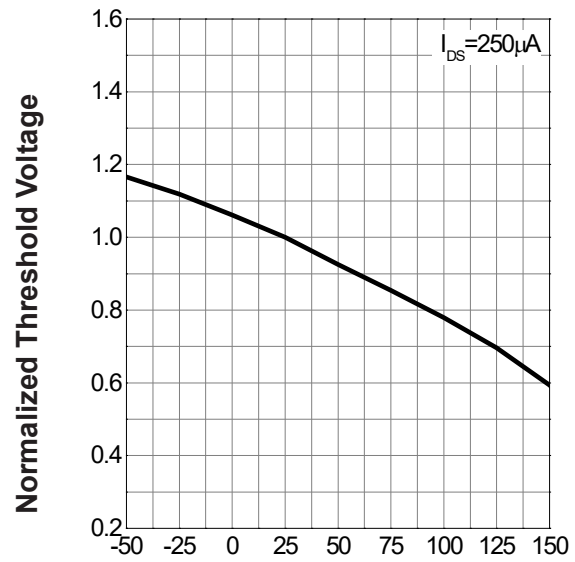
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance



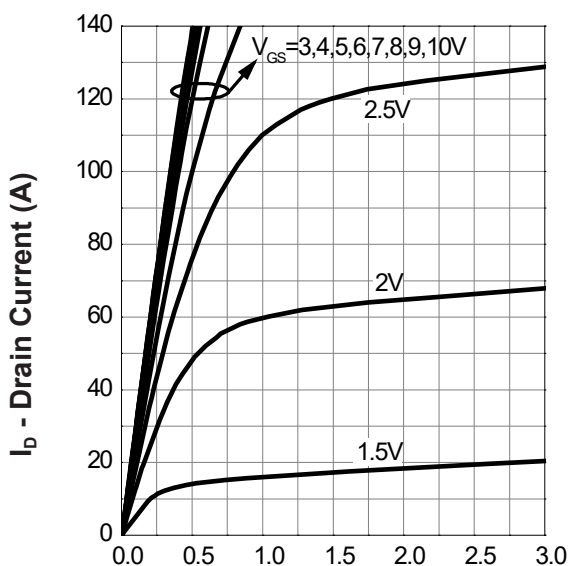
V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage



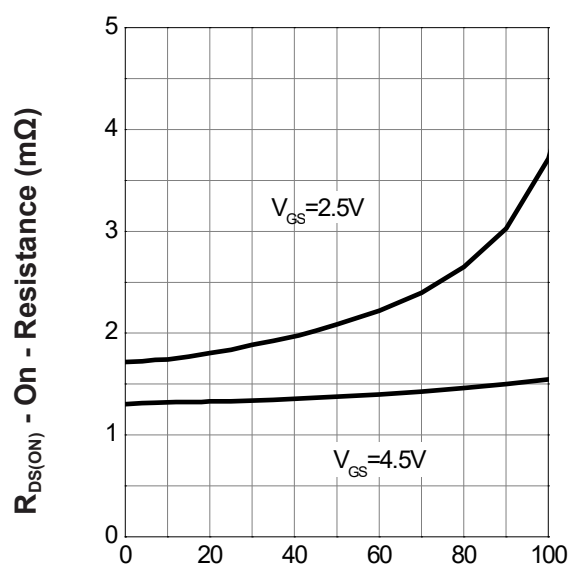
T_J - Junction Temperature ($^{\circ}C$)

Output Characteristics



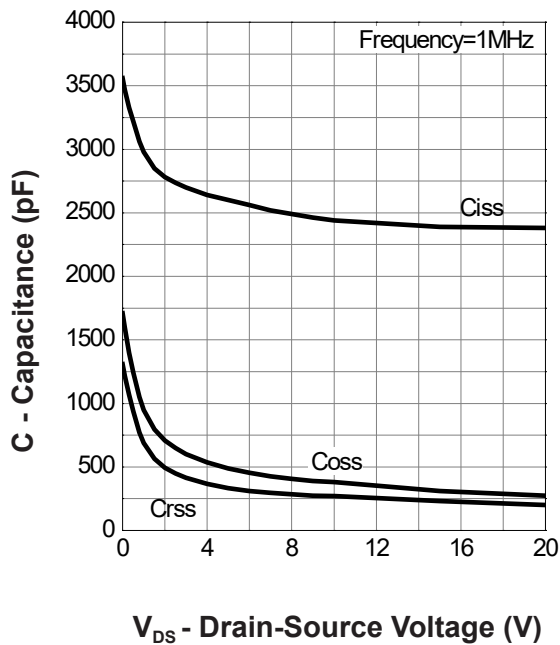
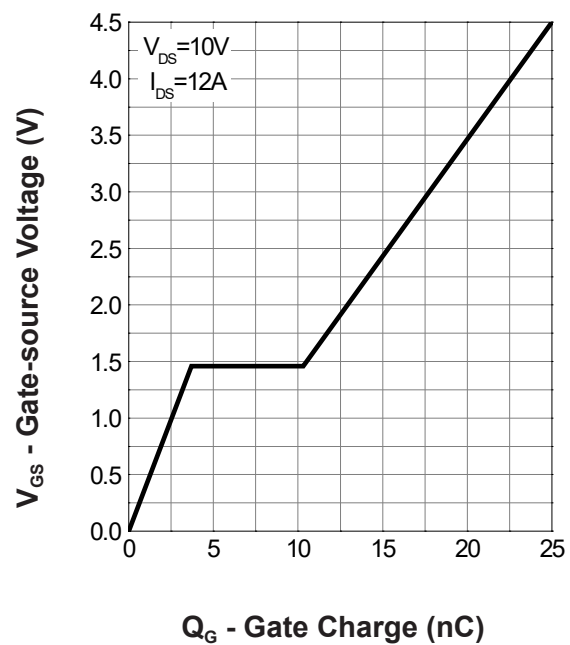
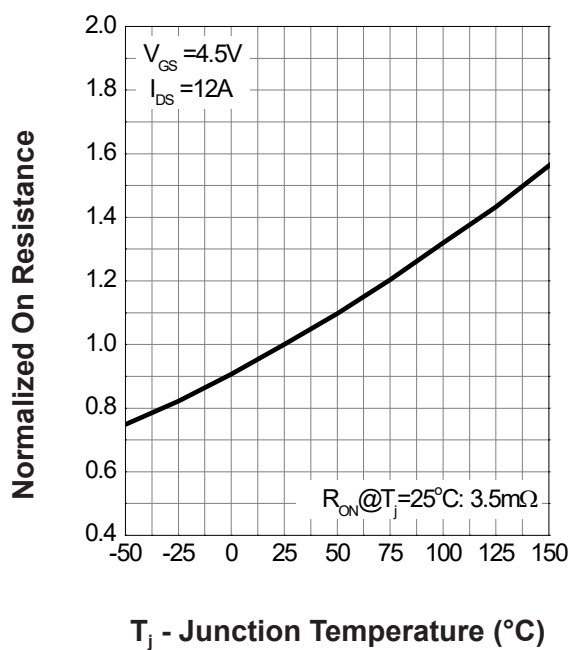
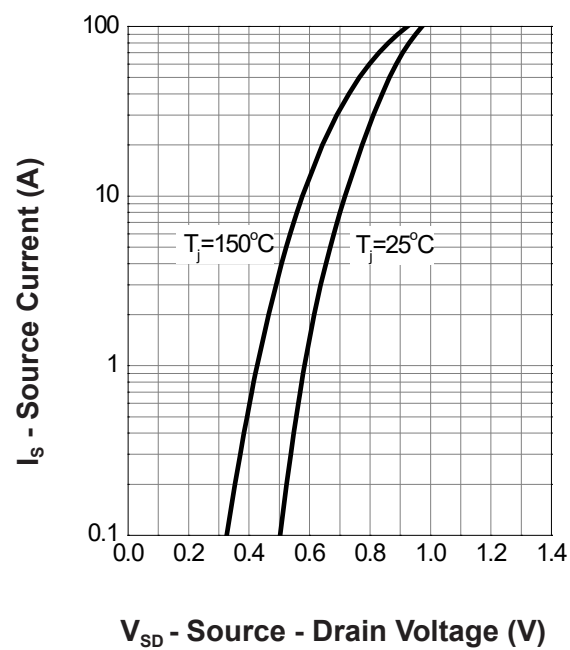
V_{DS} - Drain - Source Voltage (V)

Drain-Source On Resistance

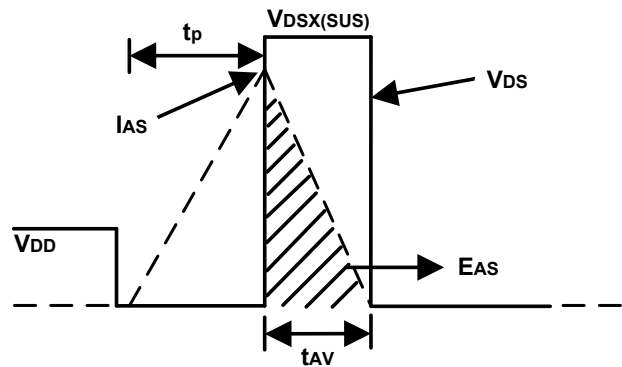
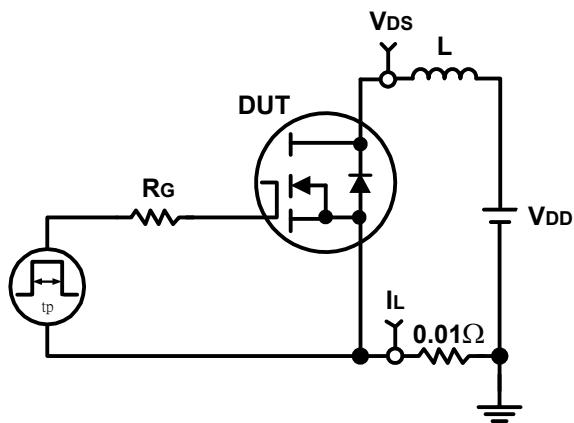


I_D - Drain Current (A)

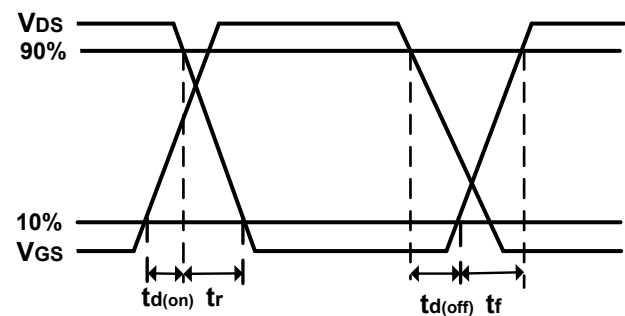
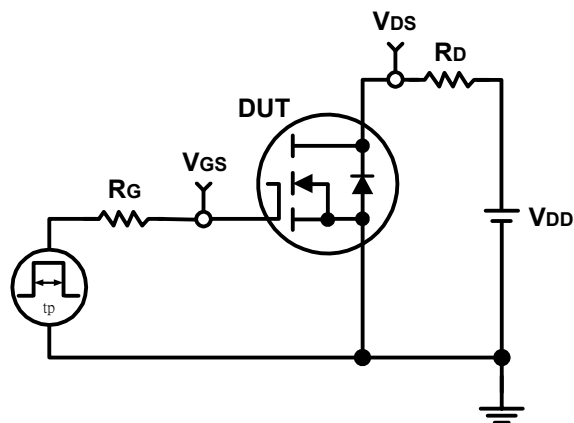
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

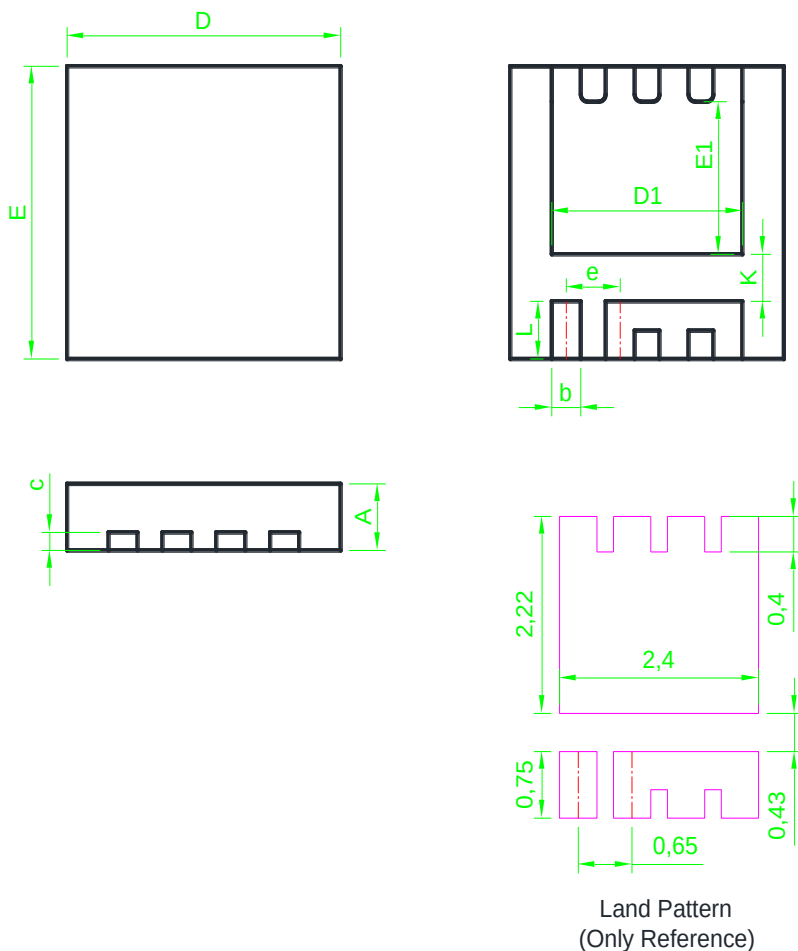


Switching Time Test Circuit and Waveforms



Package Information

SDFN3333B



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.75	0.80	0.028	0.030	0.031
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.15	0.20	0.25	0.006	0.008	0.010
D	3.20	3.30	3.40	0.126	0.130	0.134
D1	2.20	2.30	2.40	0.087	0.091	0.094
e	0.60	0.65	0.70	0.024	0.026	0.028
E	3.20	3.30	3.40	0.126	0.130	0.134
E1	1.62	1.72	1.82	0.064	0.068	0.072
L	0.55	0.65	0.75	0.022	0.026	0.030
K	0.43	0.53	0.63	0.017	0.021	0.025

Note: Dimensions do not inclusive burrs and mold flash.