

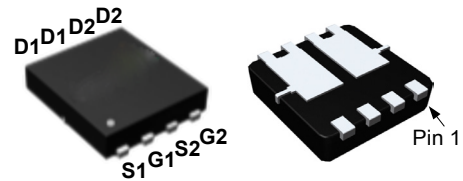
Features

- 60V/40A
 - $R_{DS(ON)} = 12m\Omega (typ.) @ V_{GS} = 10V$
 - $R_{DS(ON)} = 16m\Omega (typ.) @ V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- Moisture Sensitivity Level MSL1 (per JEDEC J-STD-020D)

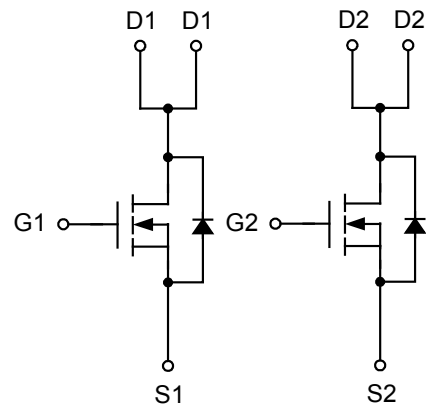
Applications

- Switching applications.

Pin Description



PDFN5*6-8L



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		60	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	40	A
I _D	Continuous Drain Current	T _C =25°C	40	A
		T _C =100°C	30	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	120	
P _D	Maximum Power Dissipation	T _C =25°C	35.7	W
		T _C =100°C	14.3	
R _{θJC}	Thermal Resistance-Junction to Case	Steady state	3.5	°C/W
R _{θJA} ^b	Thermal Resistance-Junction to Ambient	Steady state	90	°C/W
I _{AS} ^c	Avalanche Current, Single pulse	L=0.5mH	36	A
E _{AS} ^c	Avalanche Energy, Single pulse	L=0.5mH	324	mJ

Note * : Current limited by bonding wire.

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

Note b : Surface mounted on 1in^2 pad area.

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

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

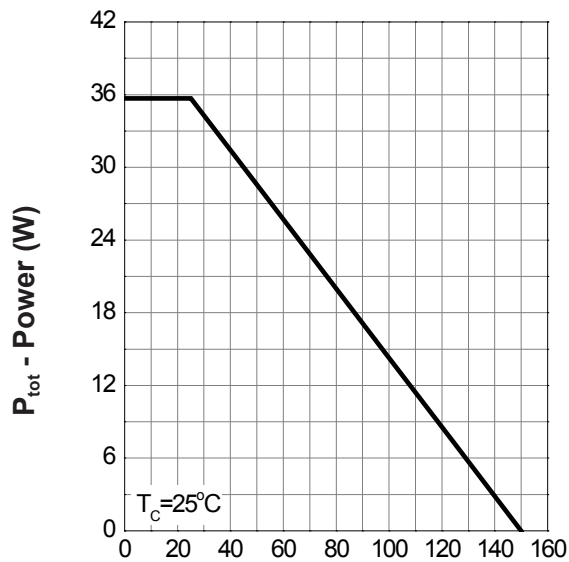
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.5	2	3	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} =10A	-	12	15	mΩ
		V _{GS} =4.5V, I _{DS} =8A	-	16	20	
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.8	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =10A, dI _{SD} /dt=100A/μs	-	35	-	ns
Q _{rr}	Reverse Recovery Charge		-	37	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1.5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz	-	2405	3125	pF
C _{oss}	Output Capacitance		-	435	-	
C _{rss}	Reverse Transfer Capacitance		-	195	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =30Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	17	31	ns
t _r	Turn-on Rise Time		-	8	15	
t _{d(OFF)}	Turn-off Delay Time		-	47	85	
t _f	Turn-off Fall Time		-	50	90	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =4.5V, I _{DS} =10A	-	17.7	-	nC
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _{DS} =10A	-	38	53	
Q _{gs}	Gate-Source Charge		-	7.7	-	
Q _{gd}	Gate-Drain Charge		-	5	-	

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

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

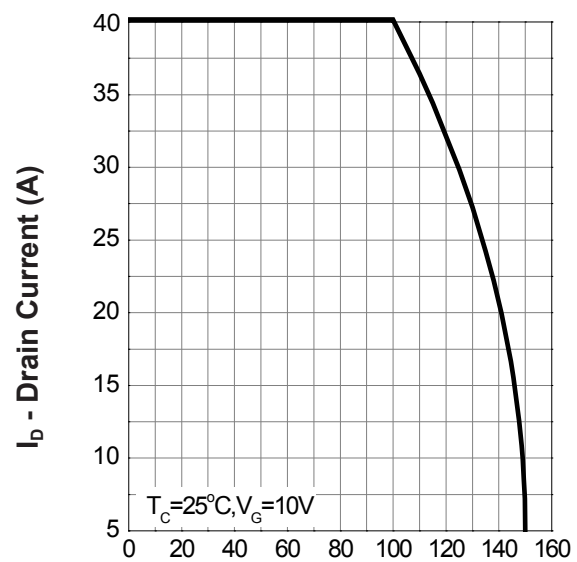
Typical Operating Characteristics

Power Dissipation



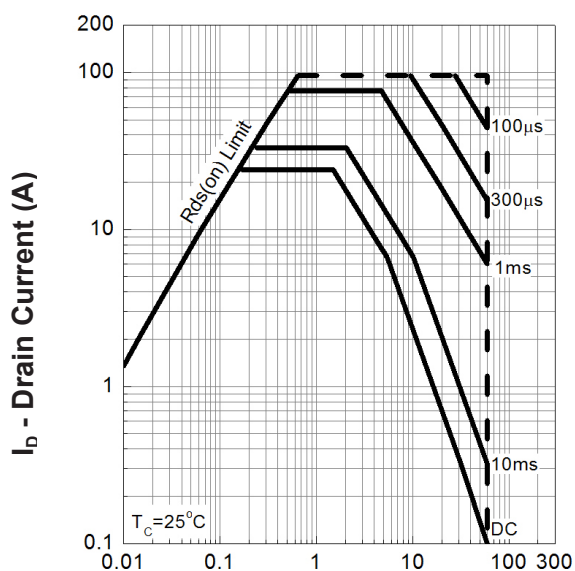
T_j - Junction Temperature (°C)

Drain Current



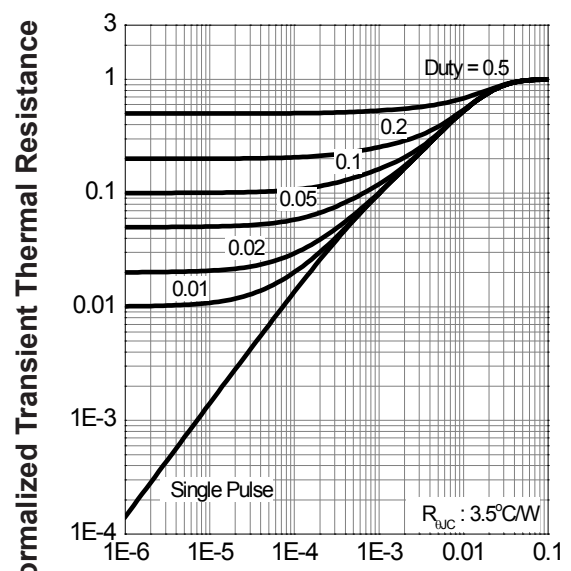
T_j - Junction Temperature (°C)

Safe Operation Area



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

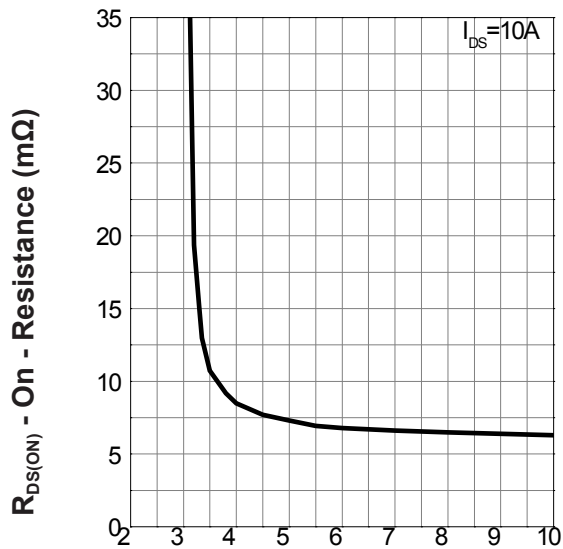
Thermal Transient Impedance



Square Wave Pulse Duration (sec)

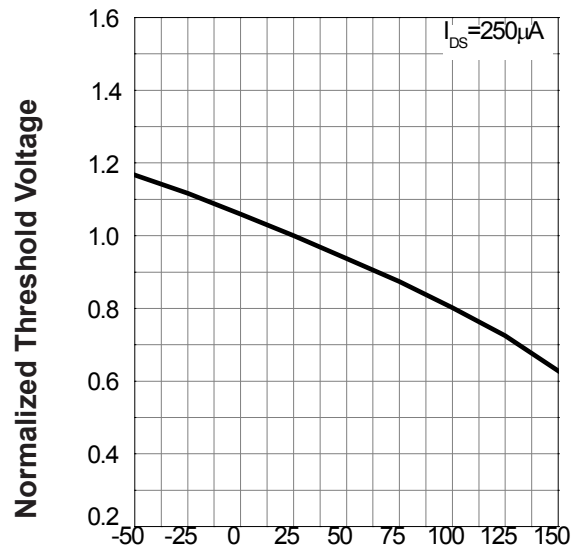
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance



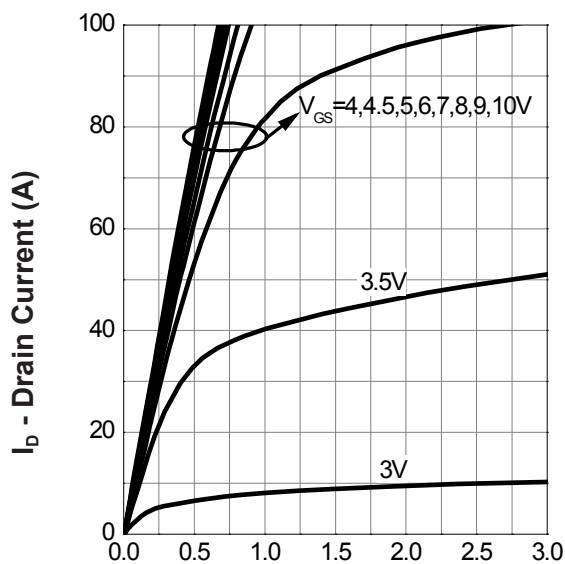
V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage



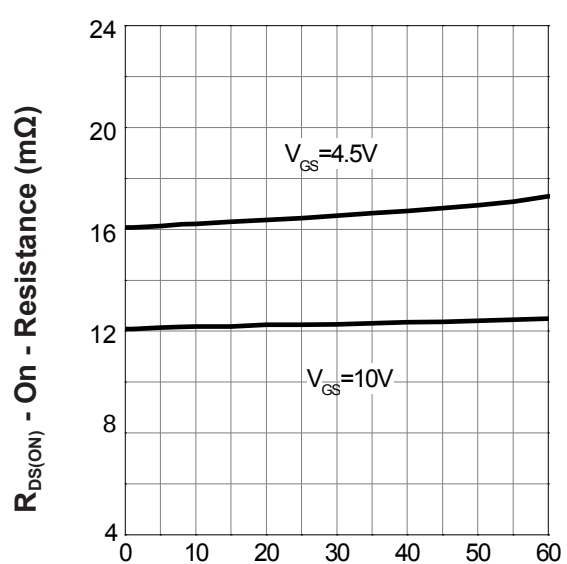
T_j - Junction Temperature (°C)

Output Characteristics



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

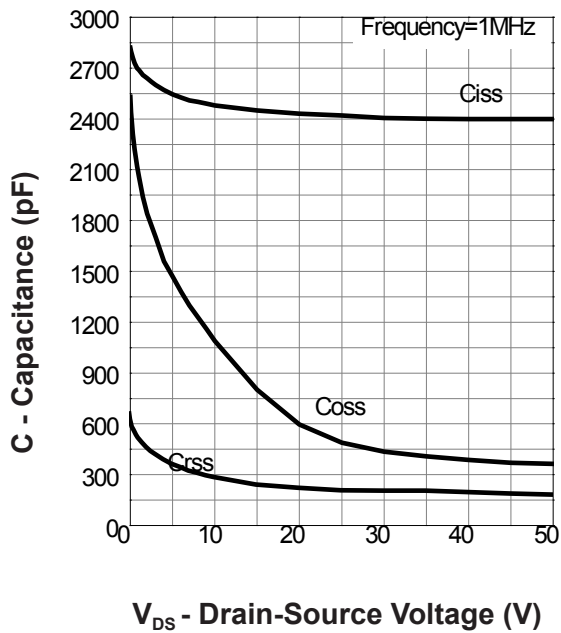
Drain-Source On Resistance



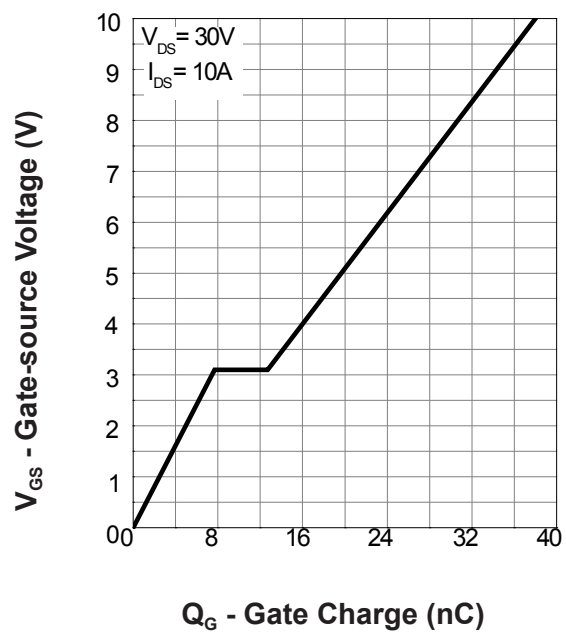
I_D - Drain Current (A)

Typical Operating Characteristics(Cont.)

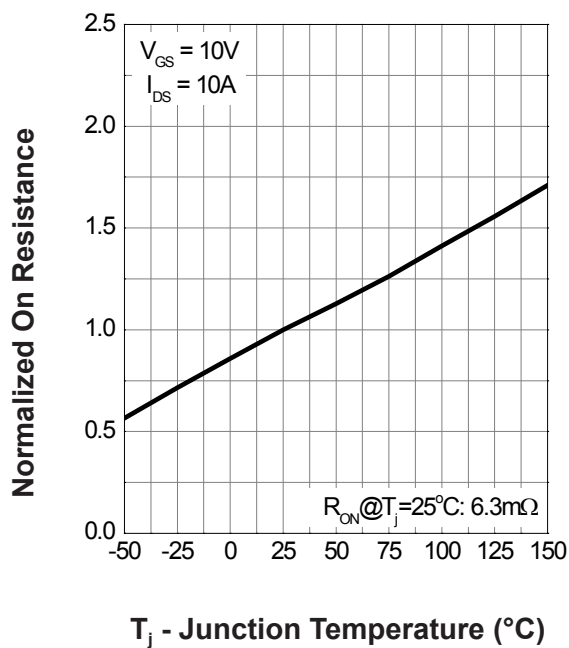
Capacitance



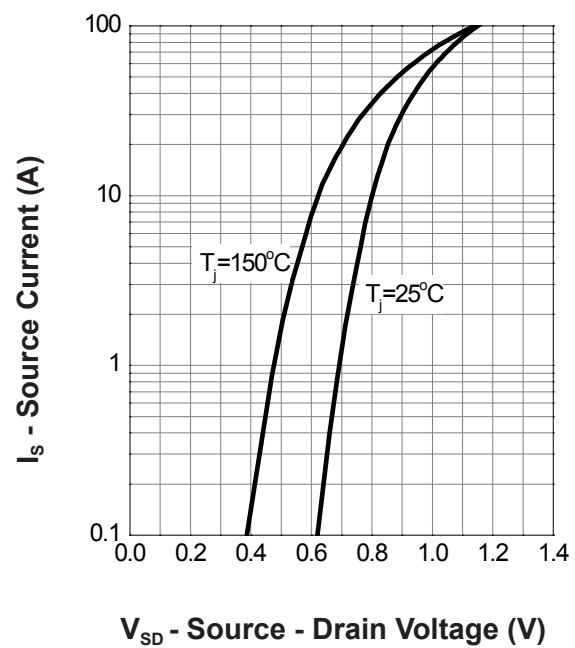
Gate Charge



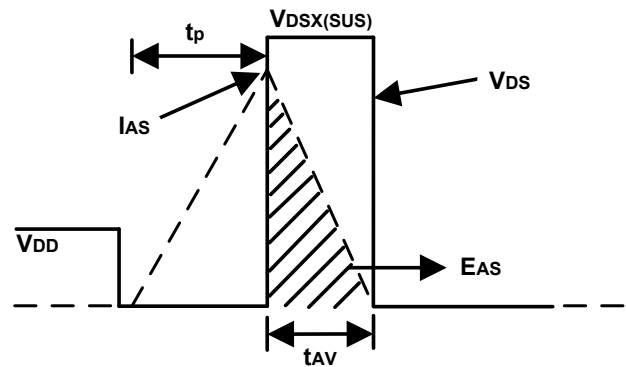
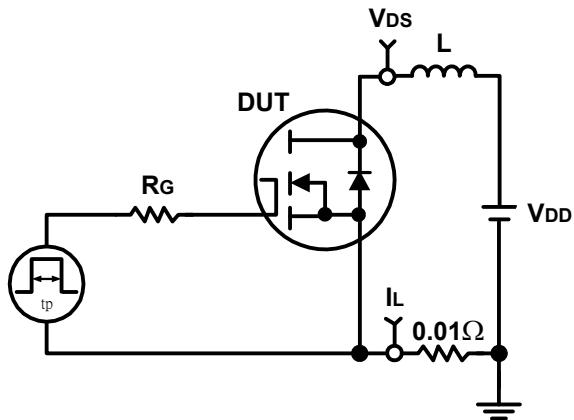
Drain-Source On Resistance



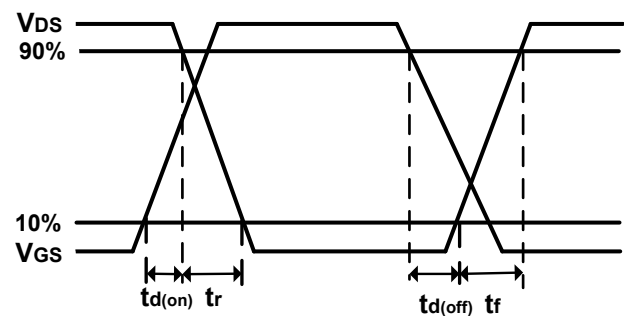
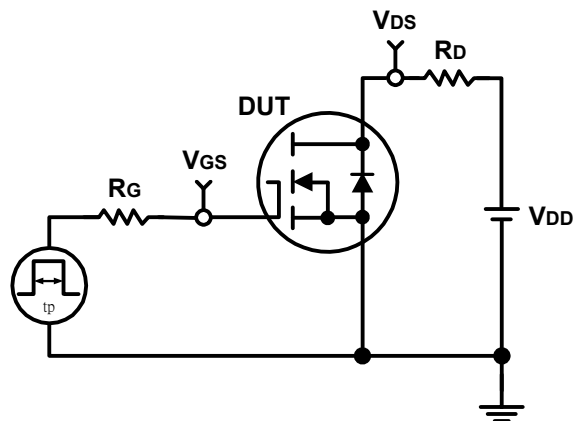
Source-Drain Diode Forward



Avalanche Test Circuit and Waveforms

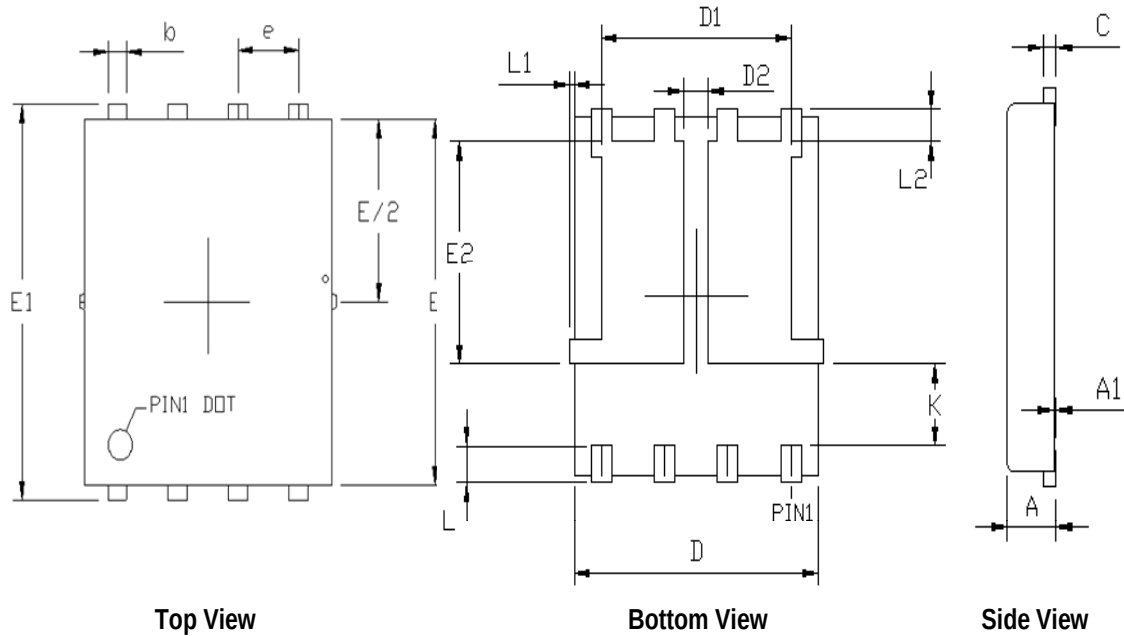


Switching Time Test Circuit and Waveforms



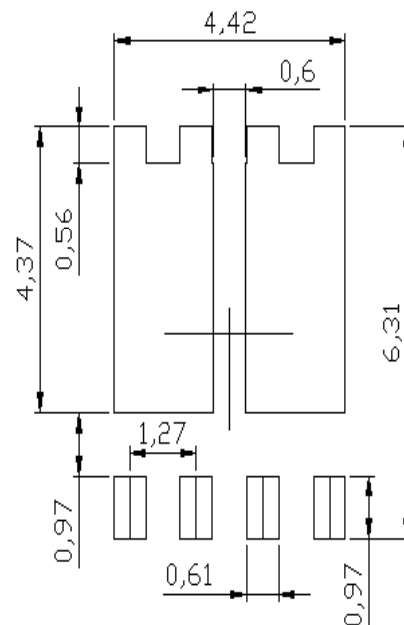
Package Information

PDFN5*6-8L



SYMBOLS	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.900	1.200	0.035	0.047
A1	0.000	0.050	0.000	0.002
b	0.300	0.500	0.012	0.020
c	0.150	0.300	0.006	0.012
D	4.800	5.000	0.189	0.197
D1	3.550	4.550	0.140	0.179
D2	0.500	0.910	0.020	0.036
E	5.650	5.850	0.222	0.230
E1	5.900	6.200	0.232	0.244
E2	3.200	3.780	0.126	0.149
e	1.27 BSC		0.050 BSC	
K	1.100	-	0.043	-
L	0.500	0.800	0.020	0.031
L1	0.000	0.150	0.000	0.006
L2	0.325	0.610	0.013	0.024

RECOMMENDED LAND PATTERN



UNIT: mm