

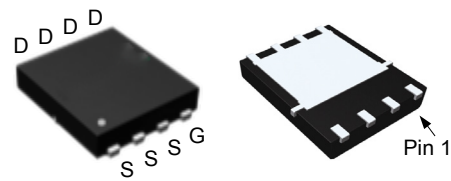
Features

- 40V/200A
 $R_{DS(ON)} = 0.75m\Omega (typ.) @ V_{GS} = 10V$
 $R_{DS(ON)} = 1.05m\Omega (typ.) @ V_{GS} = 4.5V$
- 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)

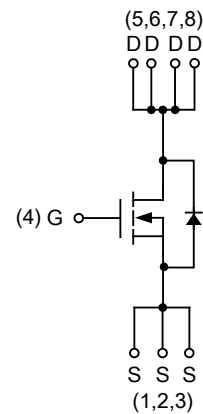
Applications

- Brushed motor drive applications
- BLDC motor drive applications
- Battery powered circuits
- Load Switch
- Synchronous rectifier applications

Pin Description



DFN5x6A-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		40	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	200	A
I _D	Continuous Drain Current	T _C =25°C	200	A
		T _C =100°C	200	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	400	
P _D	Maximum Power Dissipation	T _C =25°C	250	W
		T _C =100°C	100	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	0.5	°C/W
I _D	Continuous Drain Current	T _A =25°C	34	A
		T _A =70°C	27	
I _{DM} ^b	Pulsed Drain Current	T _A =25°C	136	
P _D	Maximum Power Dissipation	T _A =25°C	2.08	W
		T _A =70°C	1.33	
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	17	°C/W
		Steady State	60	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.5mH	50	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.5mH	756	mJ

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

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

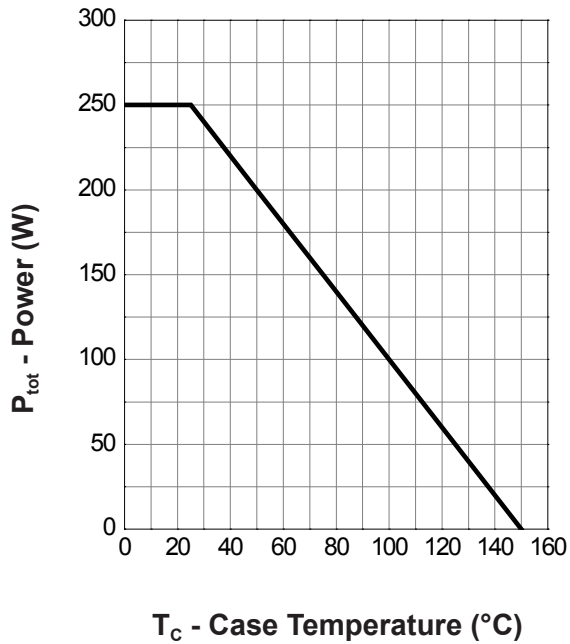
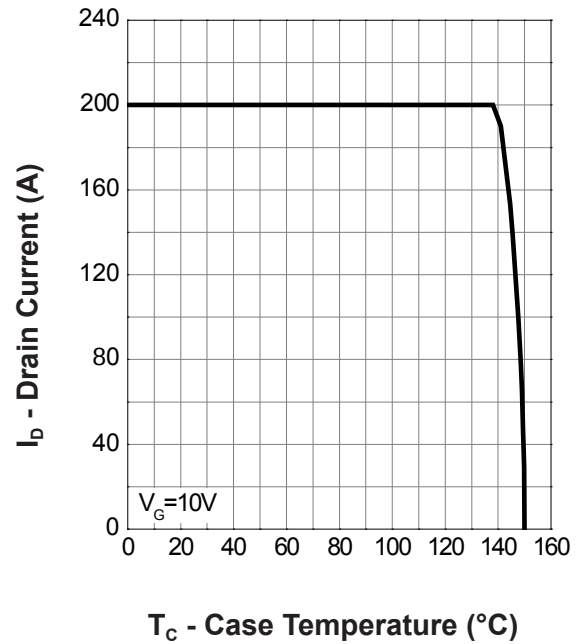
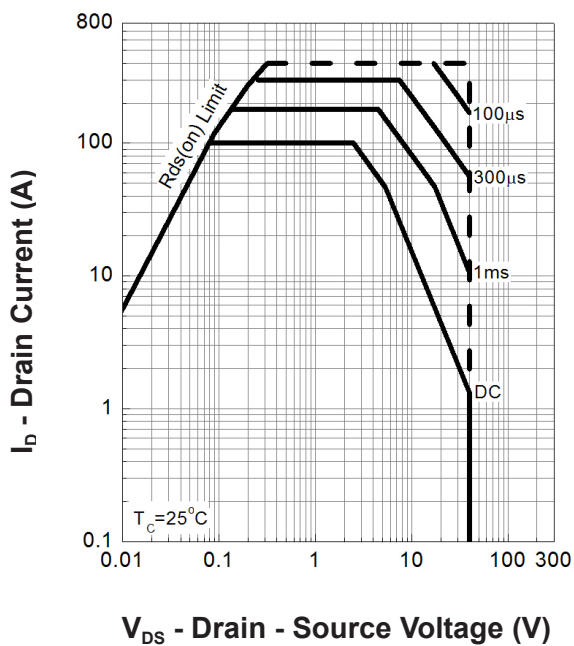
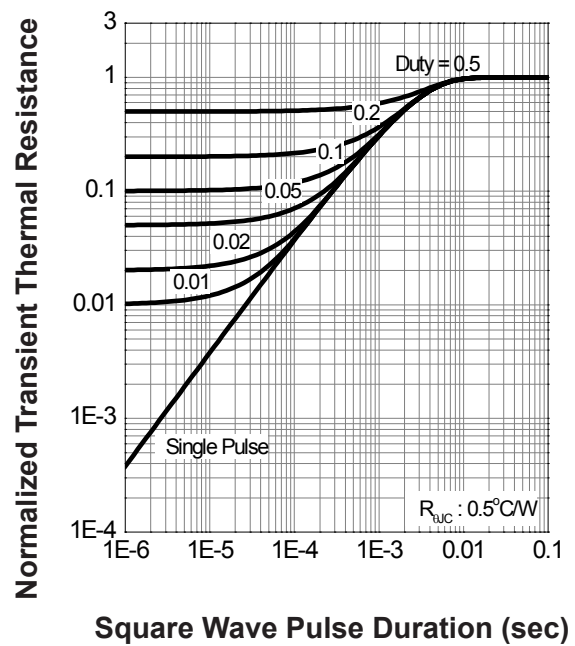
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1	1.8	3	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} =10V, I _{DS} =20A T _J =125°C	-	0.75 1.37	0.96 -	mΩ
		V _{GS} =4.5V, I _{DS} =15A	-	1.05	1.4	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	55	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.76	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =20A, dI _{SD} /dt=100A/μs	-	63	-	ns
t _a	Charge Time		-	32	-	
t _b	Discharge Time		-	31	-	
Q _{rr}	Reverse Recovery Charge		-	79	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	1	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	6270	8151	pF
C _{oss}	Output Capacitance		-	1655	-	
C _{rss}	Reverse Transfer Capacitance		-	180	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	32	58	ns
t _r	Turn-on Rise Time		-	16	29	
t _{d(OFF)}	Turn-off Delay Time		-	76	137	
t _f	Turn-off Fall Time		-	118	213	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =20A	-	82	114.8	nC
Q _{gth}	Threshold Gate Charge		-	18.9	-	
Q _{gs}	Gate-Source Charge		-	29	-	
Q _{gd}	Gate-Drain Charge		-	9.6	-	

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

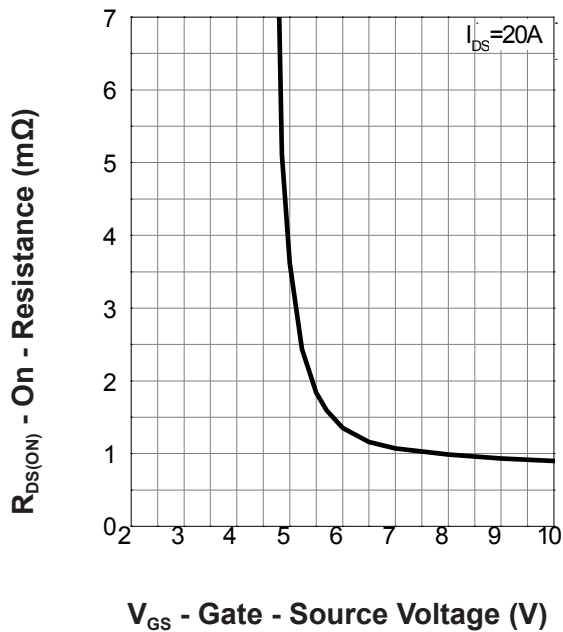
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

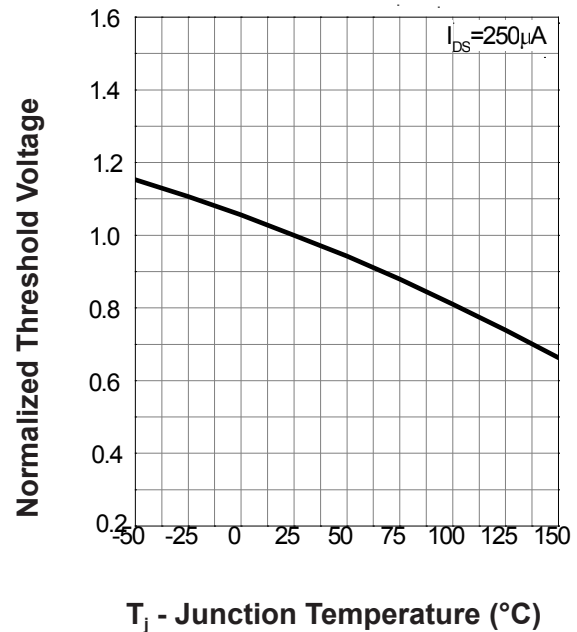
Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


Typical Operating Characteristics(Cont.)

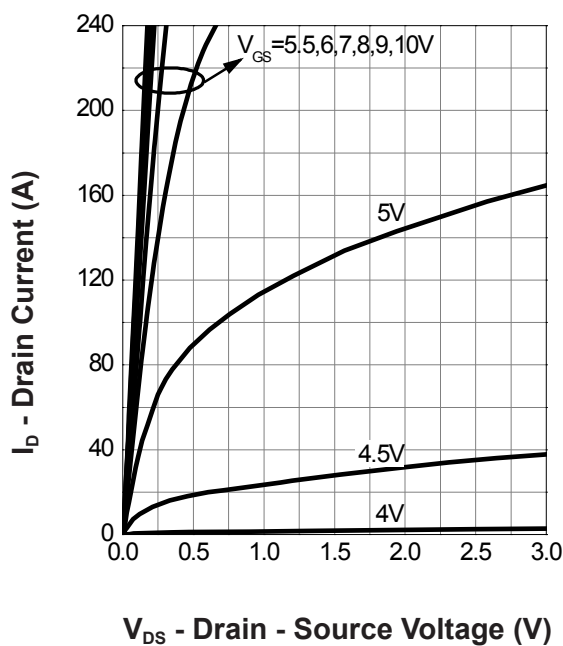
Gate-Source On Resistance



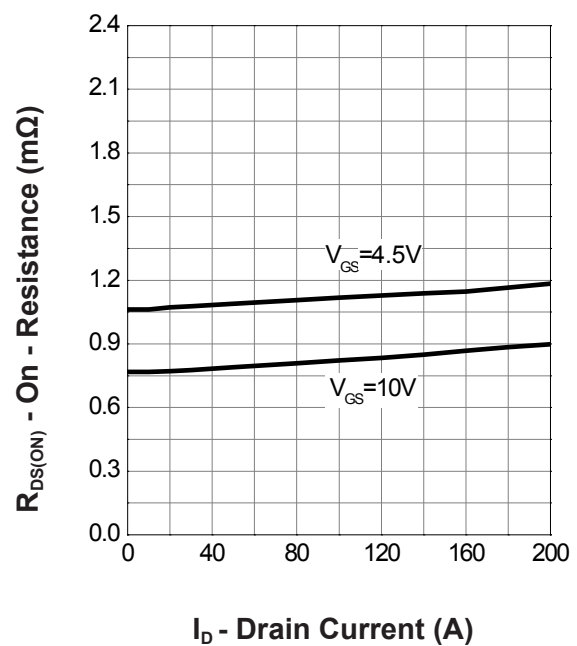
Gate Threshold Voltage



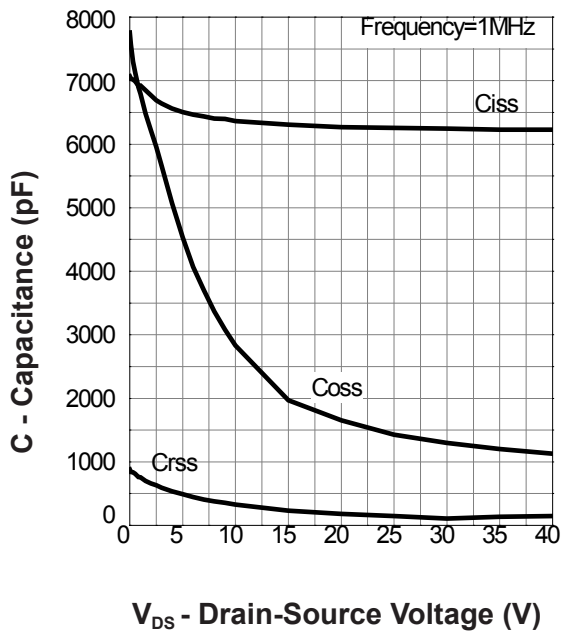
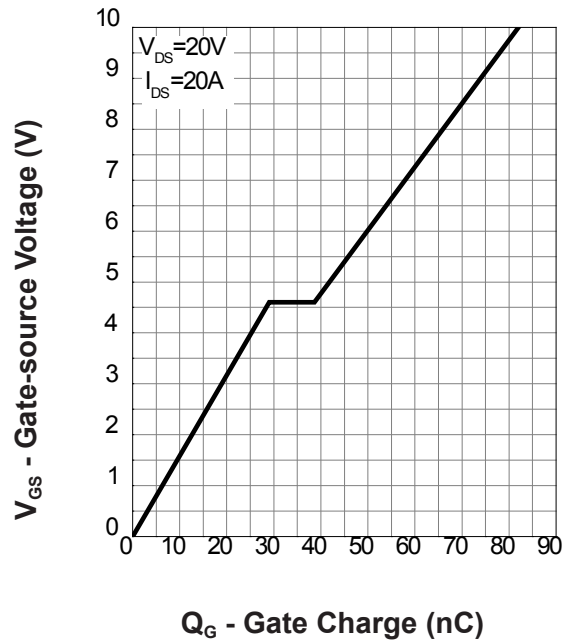
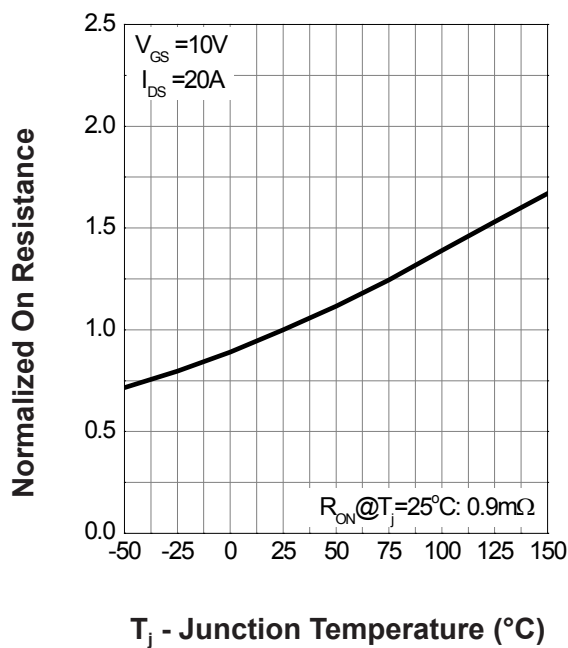
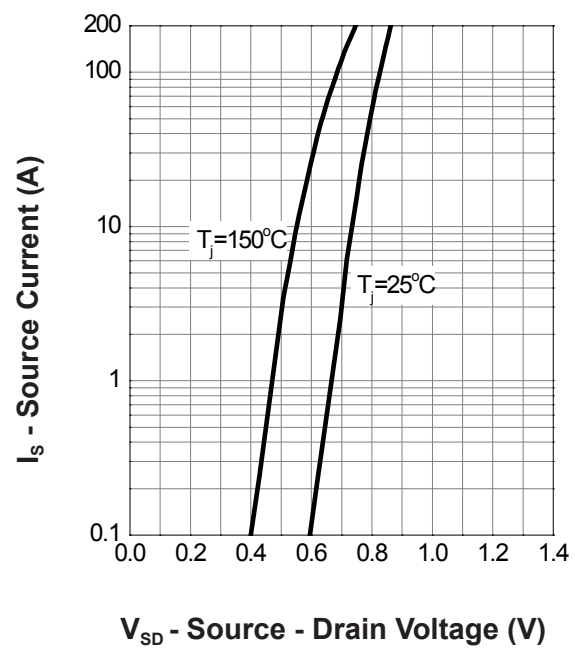
Output Characteristics



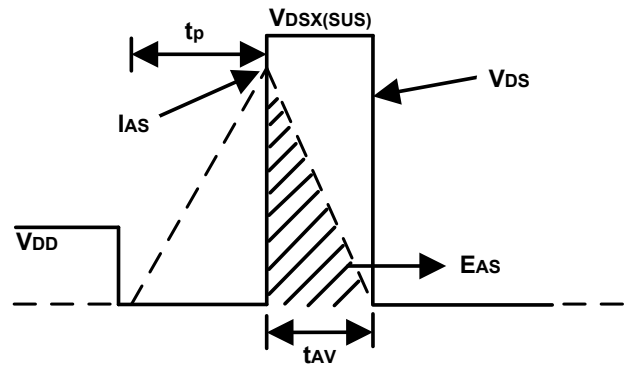
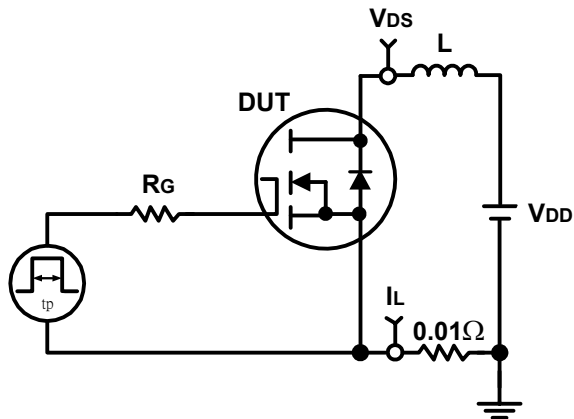
Drain-Source On Resistance



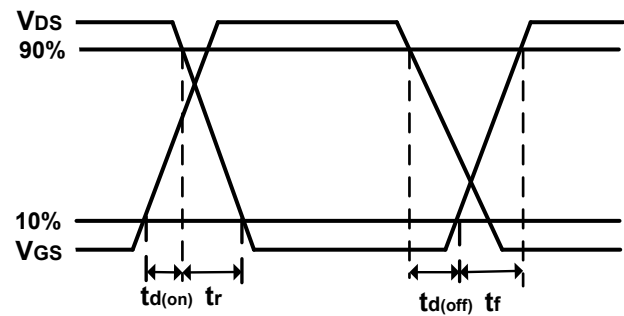
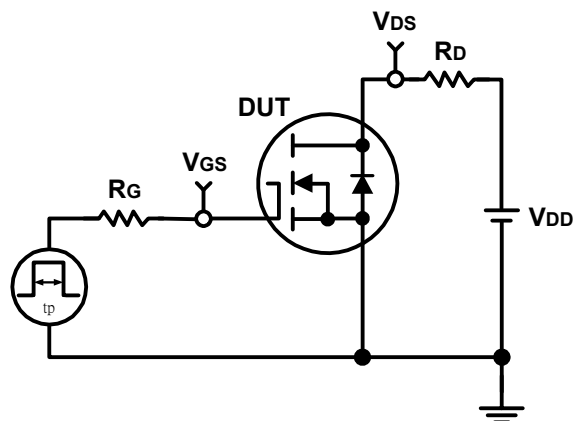
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

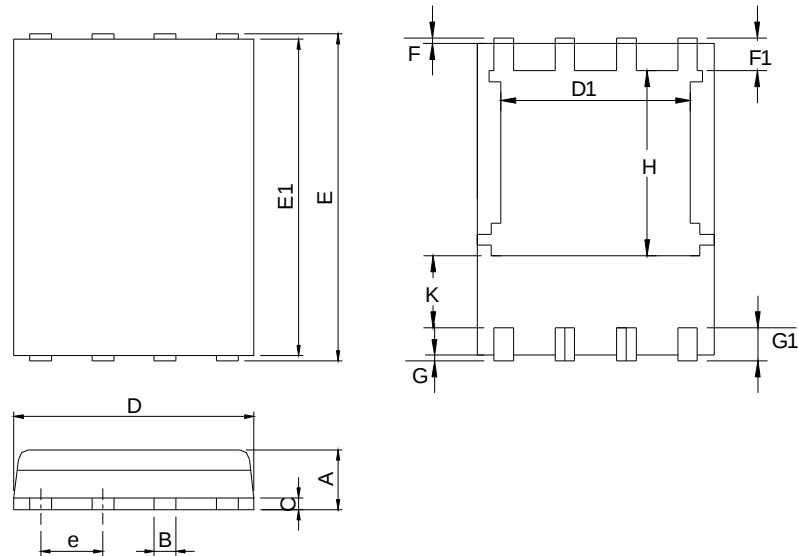


Switching Time Test Circuit and Waveforms



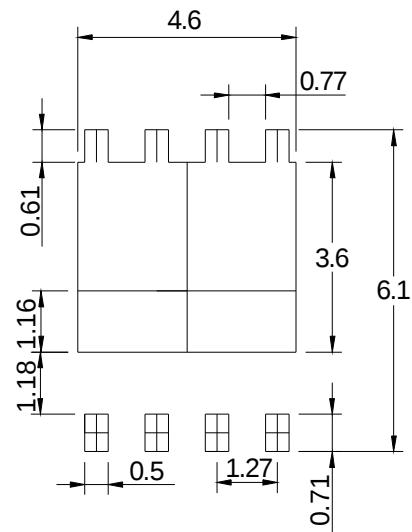
Package Information

DFN5x6-8



SYMBOL	DFN5x6-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.90	1.20	0.035	0.047
B	0.3	0.51	0.012	0.020
C	0.19	0.25	0.007	0.010
D	4.80	5.30	0.189	0.209
D1	4.00	4.40	0.157	0.173
E	5.90	6.20	0.232	0.244
E1	5.50	5.80	0.217	0.228
e	1.27 BSC		0.050 BSC	
F	0.05	0.30	0.002	0.012
F1	0.35	0.75	0.014	0.030
G	0.05	0.30	0.002	0.012
G1	0.35	0.75	0.014	0.030
H	3.34	3.9	0.131	0.154
K	0.762	-	0.03	-

RECOMMENDED LAND PATTERN



UNIT: mm

Note : 1.Dimension D, D1,D2 and E1 do not include mold flash or protrusions.
Mold flash or protrusions shall not exceed 10 mil.