

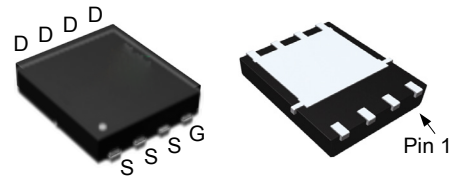
Features

- 40V/48A
 $R_{DS(ON)}=5.5m\Omega(typ.)@V_{GS}=10V$
 $R_{DS(ON)}=7.5m\Omega(typ.)@V_{GS}=4.5V$
- 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)

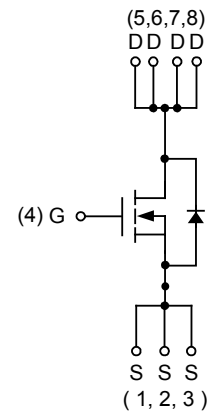
Applications

- Power Management in Desktop Computer or DC/DC Converters.

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	175	$^{\circ}\text{C}$
T_{STG}	Storage Temperature Range	-55 to 175	$^{\circ}\text{C}$
I_S	Diode Continuous Forward Current	$T_C=25^{\circ}\text{C}$ 60	A
I_D	Continuous Drain Current	$T_C=25^{\circ}\text{C}$ 60	A
		$T_C=100^{\circ}\text{C}$ 38	
I_{DM}	Pulse Drain Current	$T_C=25^{\circ}\text{C}$ 180	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$ 36	W
		$T_C=100^{\circ}\text{C}$ 17.8	
$R_{\theta\text{JC}}$	Thermal Resistance-Junction to Case	Steady State 4.2	$^{\circ}\text{C/W}$
I_D	Continuous Drain Current	$T_A=25^{\circ}\text{C}$ 12.2	A
		$T_A=70^{\circ}\text{C}$ 10.3	
I_{DM}^{a}	Pulse Drain Current	$T_A=25^{\circ}\text{C}$ 51	A
P_D^{b}	Maximum Power Dissipation	$T_A=25^{\circ}\text{C}$ 2.3	W
		$T_A=70^{\circ}\text{C}$ 1.6	
$R_{\theta\text{JA}}^{\text{b}}$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$ 25	$^{\circ}\text{C/W}$
		Steady State 64	
I_{AS}^{c}	Avalanche Current, Single pulse	$L=0.1\text{mH}$ 50	A
E_{AS}^{c}	Avalanche Energy, Single pulse	$L=0.1\text{mH}$ 125	mJ

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

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

Note c : UIS tested and pulse width limited by maximum junction temperature 175°C (initial temperature $T_J=25^{\circ}\text{C}$).

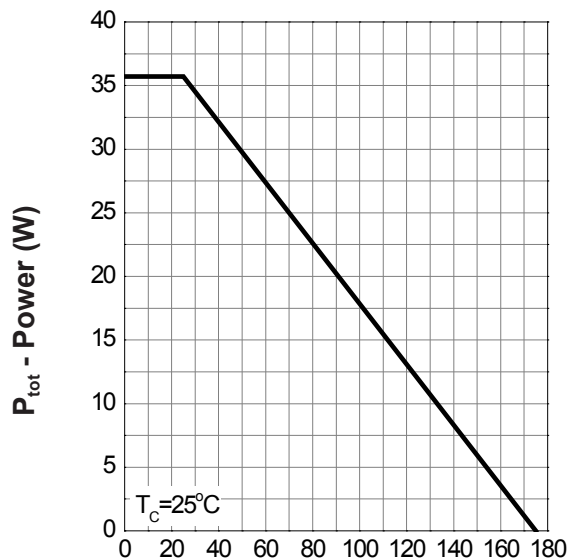
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	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	1.0	1.6	2.2	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} =20A T _J =125°C	-	5.5 9.4	7.5 -	mΩ
		V _{GS} =4.5V, I _{DS} =15A	-	7.5	11.5	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	20	-	S
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =25A, V _{GS} =0V	-	0.85	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =20A, dI _{SD} /dt=100A/μs	-	20.2	-	ns
t _a	Charge Time		-	10.4	-	
t _b	Discharge Time		-	8.8	-	
Q _{rr}	Reverse Recovery Charge		-	9.4	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	1.6	3.2	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	1777	2011	pF
C _{oss}	Output Capacitance		-	185	-	
C _{rss}	Reverse Transfer Capacitance		-	126	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	8.2	15	ns
t _r	Turn-on Rise Time		-	7.3	14	
t _{d(OFF)}	Turn-off Delay Time		-	20.6	38	
t _f	Turn-off Fall Time		-	12.2	22	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =20A	-	12.6	17.64	nC
Q _{gth}	Threshold Gate Charge		-	1.5	-	
Q _{gs}	Gate-Source Charge		-	2.8	-	
Q _{gd}	Gate-Drain Charge		-	1.6	-	

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

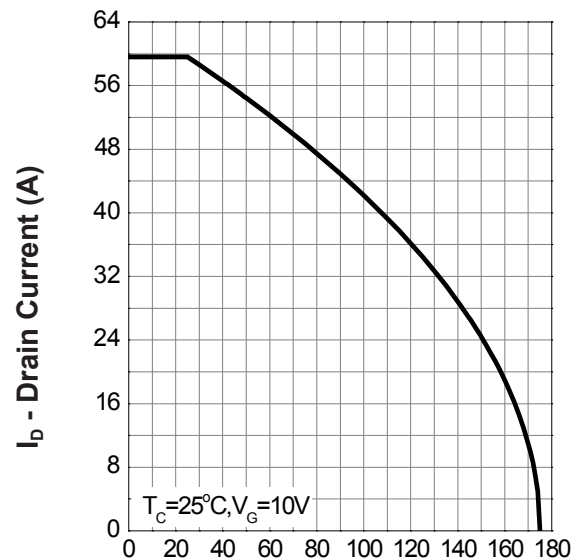
Typical Operating Characteristics

Power Dissipation



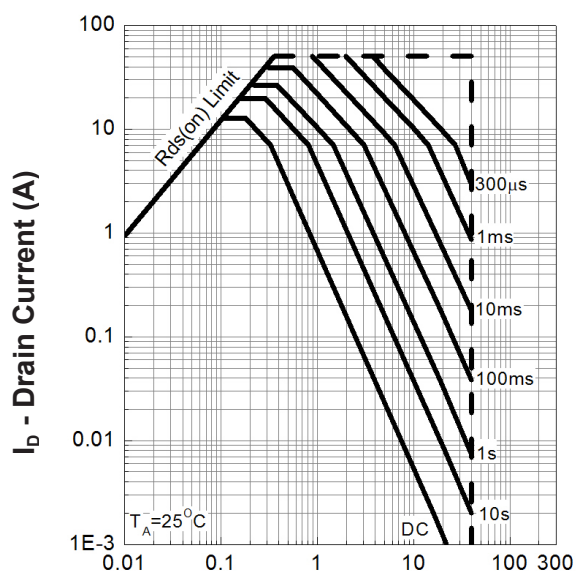
T_j - Junction Temperature ($^{\circ}\text{C}$)

Drain Current



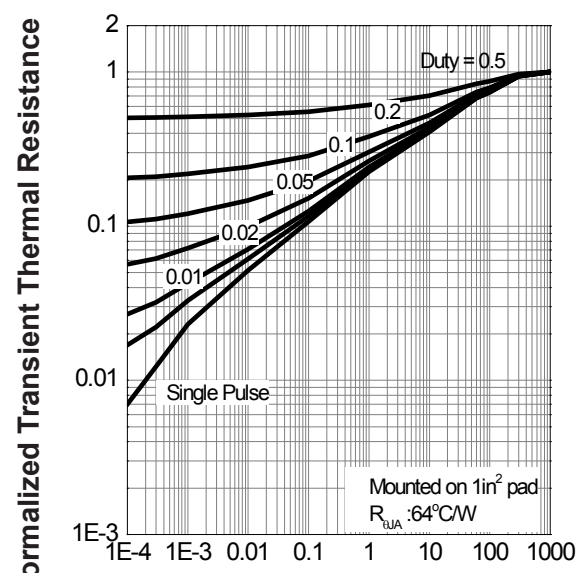
T_j - Junction Temperature ($^{\circ}\text{C}$)

Safe Operation Area



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

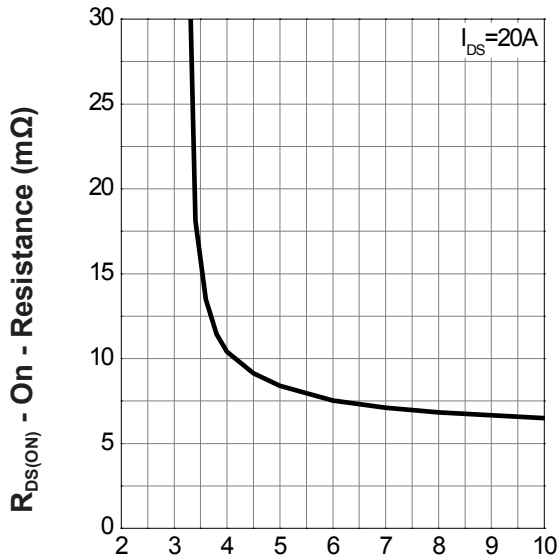
Thermal Transient Impedance



Square Wave Pulse Duration (sec)

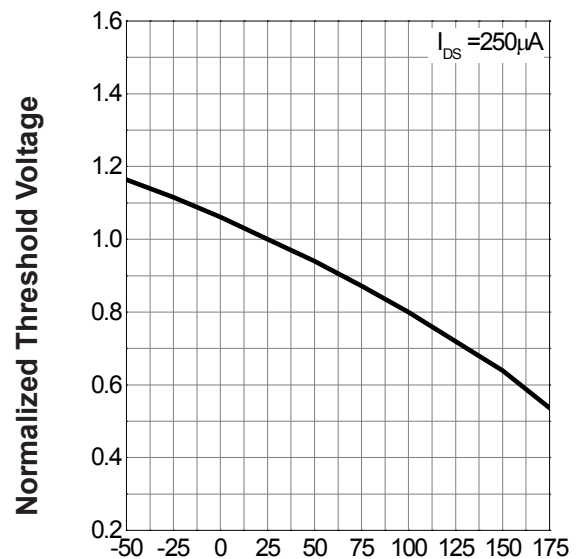
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance



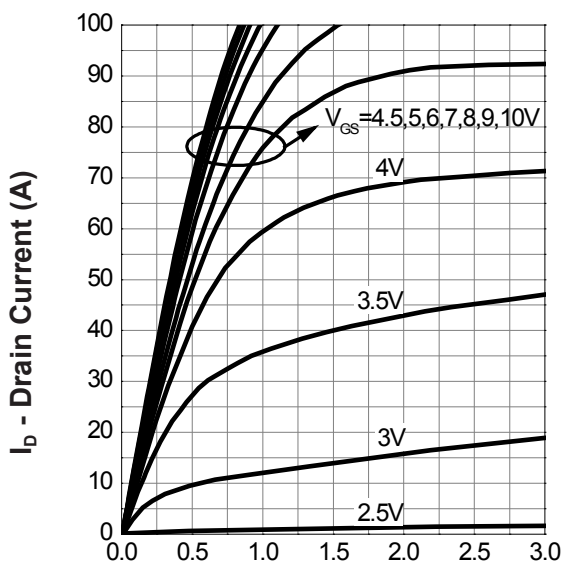
V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage



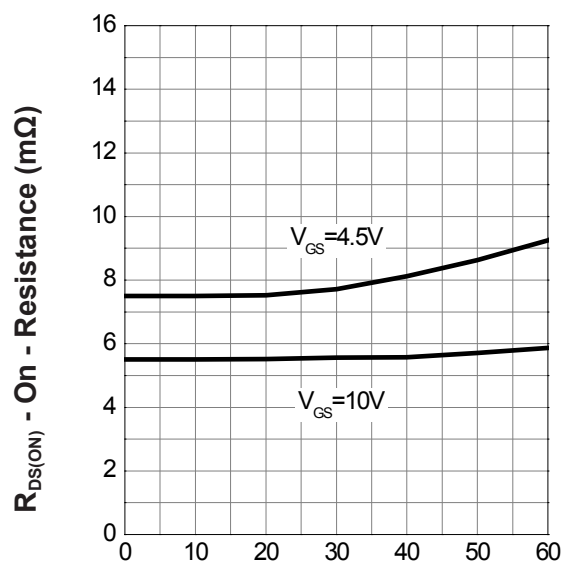
T_J - Junction Temperature ($^{\circ}C$)

Output Characteristics



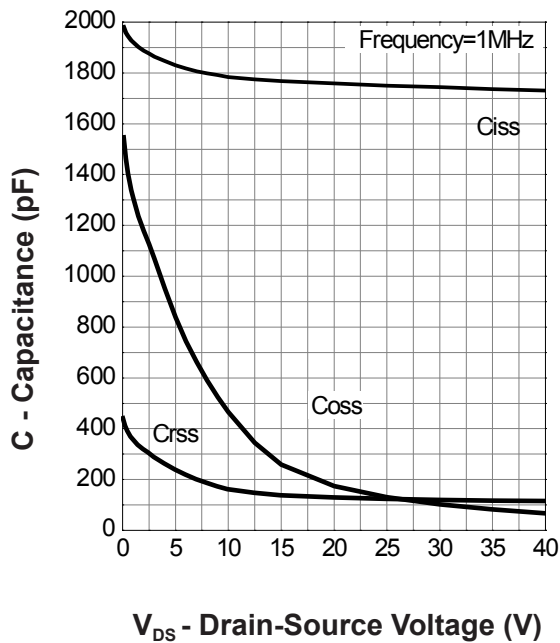
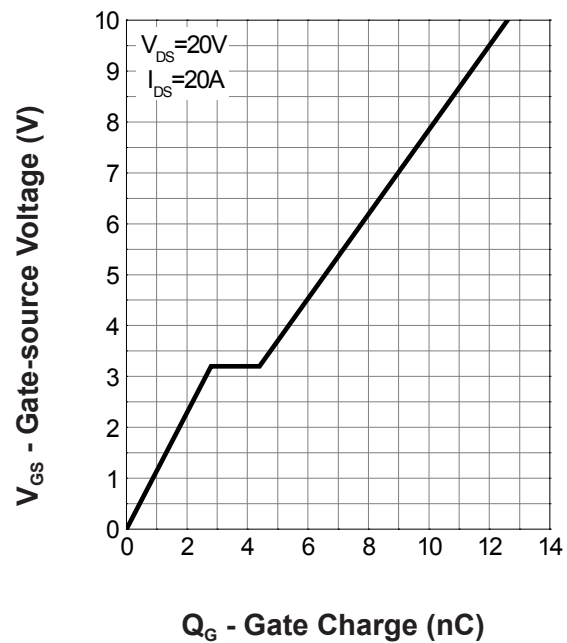
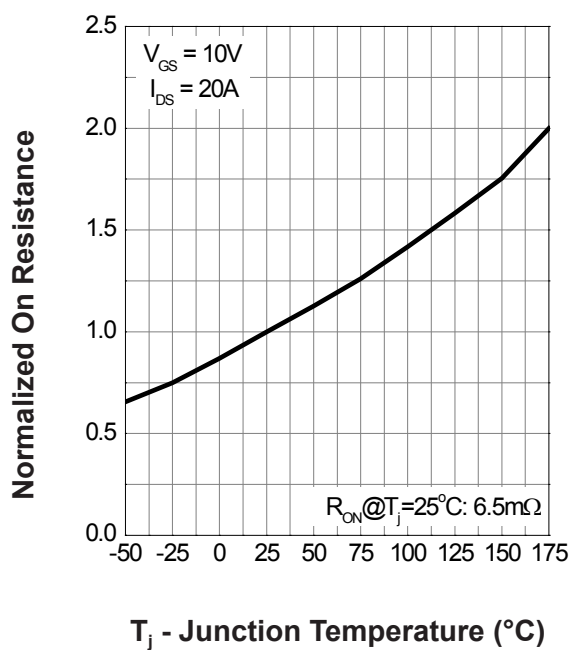
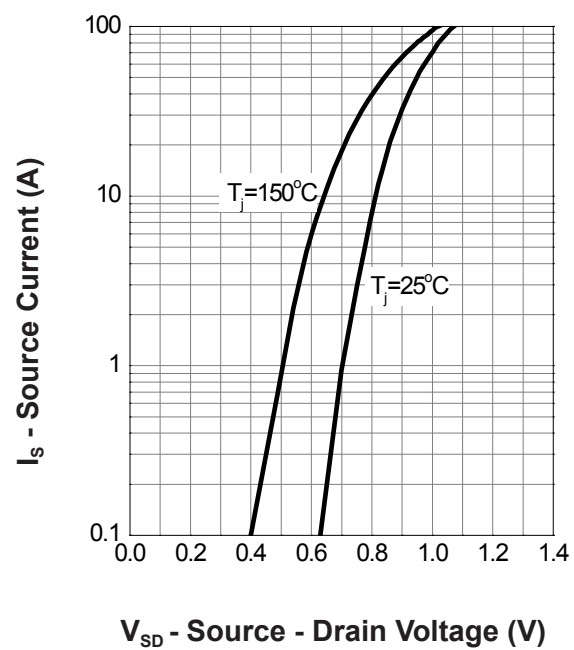
V_{DS} - Drain - Source Voltage (V)

Drain-Source On Resistance

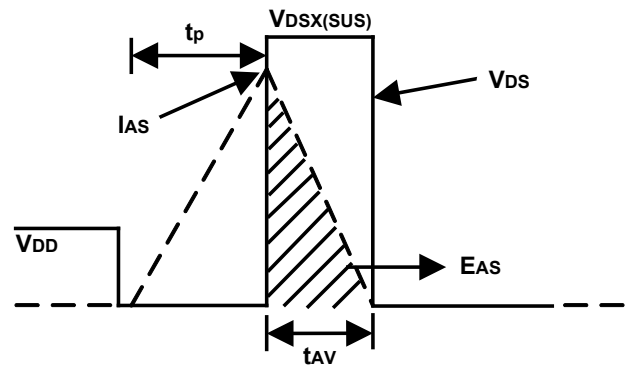
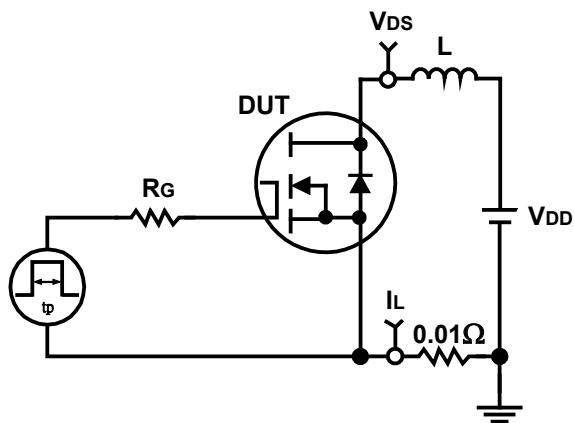


I_D - Drain Current (A)

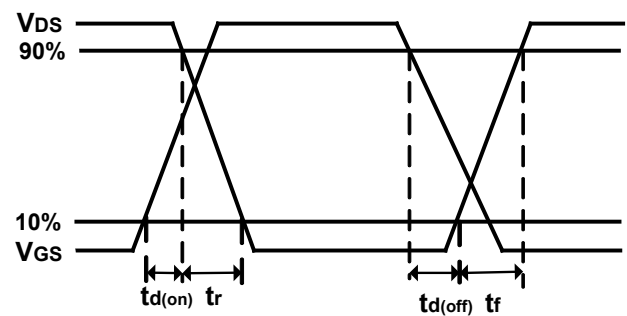
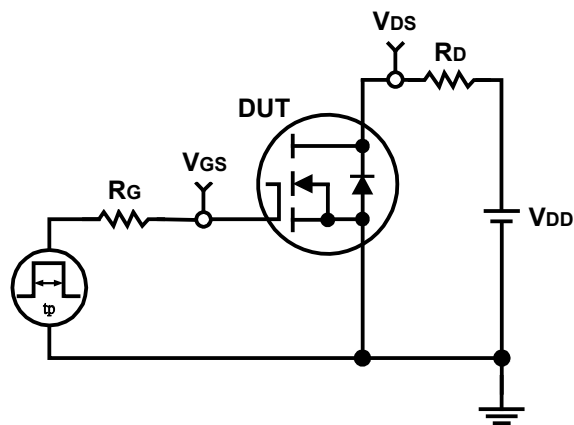
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


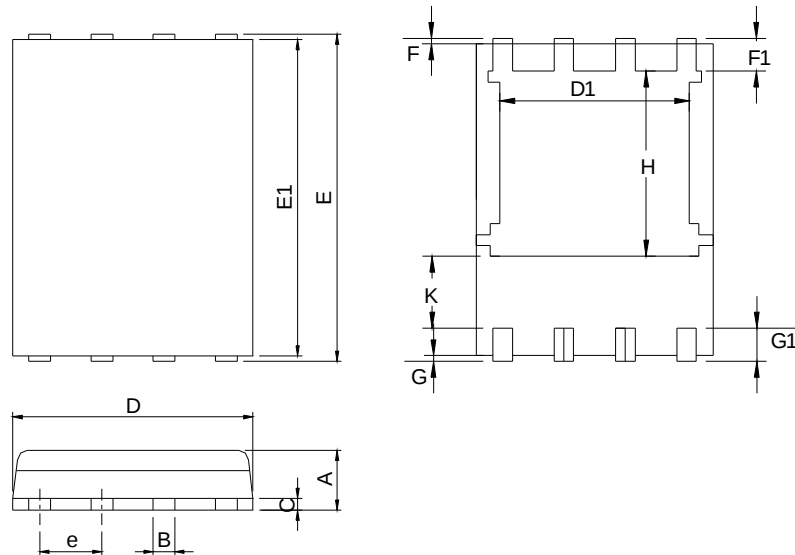
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

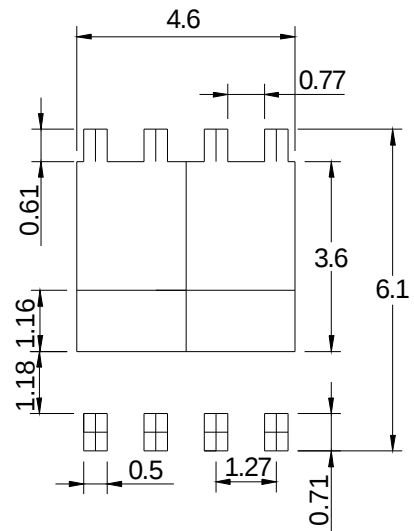


Package Information

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.