

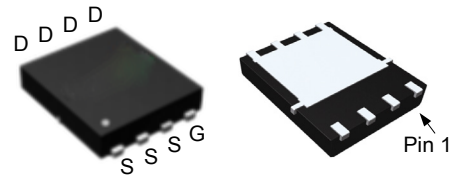
Features

- 40V/180A
 - $R_{DS(ON)}=1.2m\Omega(typ.)@V_{GS}=10V$
 - $R_{DS(ON)}=1.6m\Omega(typ.)@V_{GS}=4.5V$
- 100% UIS Tested
- Reliable and Rugged
- Lower Q_g and Q_{gd} for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- Lead Free and Green Devices Available
(RoHS Compliant)
- Moisture Sensitivity Level MSL1
(per JEDEC J-STD-020D)

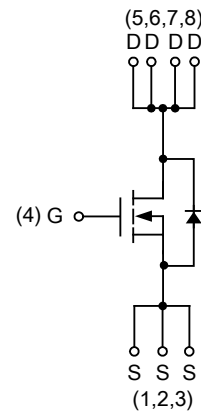
Applications

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

Pin Description



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		40	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	
I _S	Diode Continuous Forward Current	T _C =25°C	180	A
I _D ^a	Continuous Drain Current	T _C =25°C	180	
		T _C =100°C	135	
I _{DM} ^b	Pulse Drain Current	T _C =25°C	540	
P _D	Maximum Power Dissipation	T _C =25°C	89	W
		T _C =100°C	44	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	1.7	°C/W
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	24	°C/W
		Steady State	60	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	48	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	115	mJ

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

Note b : Pulse width is 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 150°C (initial temperature $T_J=25^{\circ}\text{C}$).

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

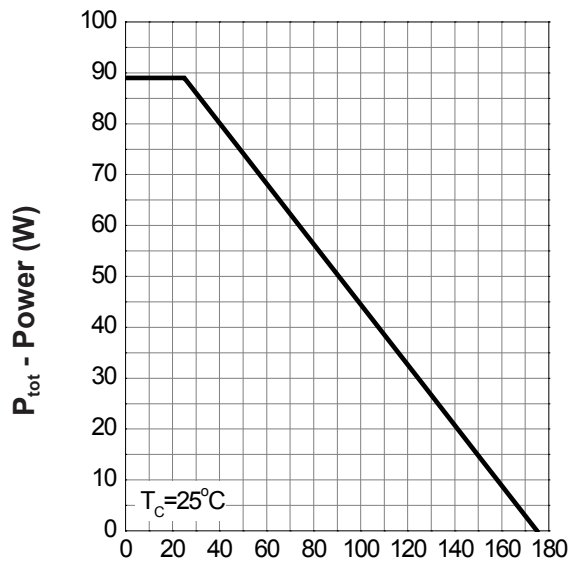
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.6	2.5	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} =25A V _{GS} =4.5V, I _{DS} =15A	-	1.2 1.6	1.5 2.0	mΩ
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	47.3	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =25A, V _{GS} =0V	-	0.75	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =25A, dI _{SD} /dt=100A/μs	-	40	-	ns
t _a	Charge Time		-	22.2	-	
t _b	Discharge Time		-	17.6	-	
Q _{rr}	Reverse Recovery Charge		-	33.2	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1	2	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	3125	4063	pF
C _{oss}	Output Capacitance		-	772	-	
C _{rss}	Reverse Transfer Capacitance		-	104	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	18.3	33	ns
t _r	Turn-on Rise Time		-	9.8	18	
t _{d(OFF)}	Turn-off Delay Time		-	56.6	102	
t _f	Turn-off Fall Time		-	50.3	91	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =25A	-	50	70	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =25A	-	23	-	
Q _{gth}	Threshold Gate Charge		-	5	-	
Q _{gs}	Gate-Source Charge		-	8.9	-	
Q _{gd}	Gate-Drain Charge		-	6.1	-	

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

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

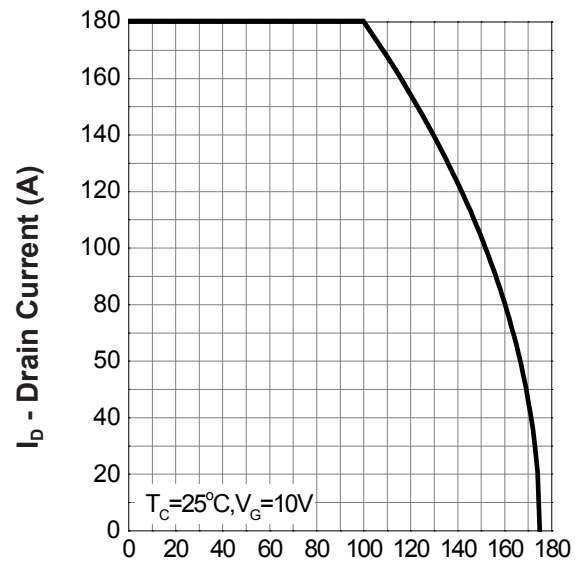
Typical Operating Characteristics

Power Dissipation



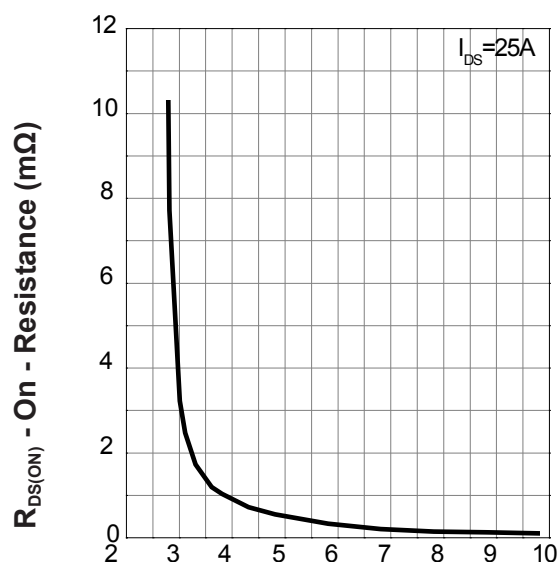
T_j - Junction Temperature ($^{\circ}\text{C}$)

Drain Current



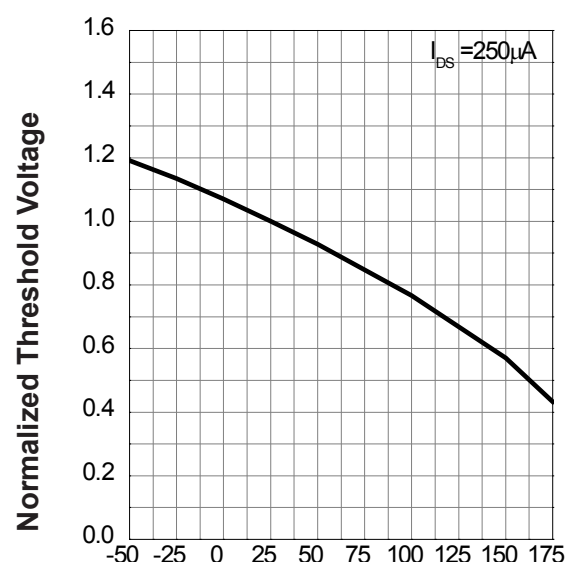
T_j - Junction Temperature ($^{\circ}\text{C}$)

Gate-Source On Resistance



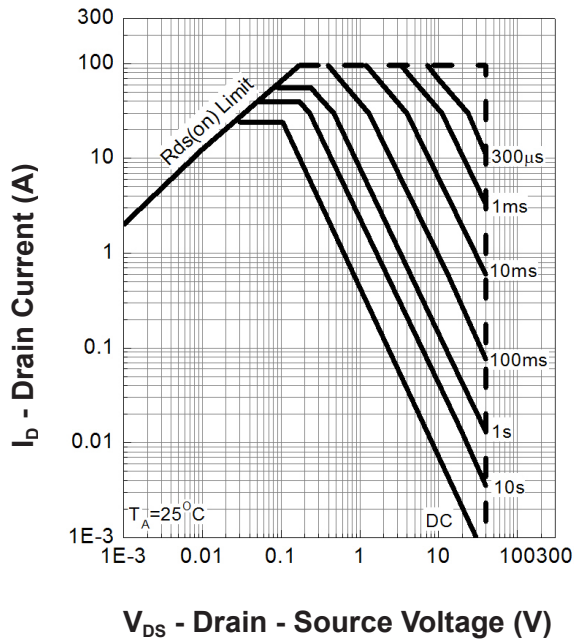
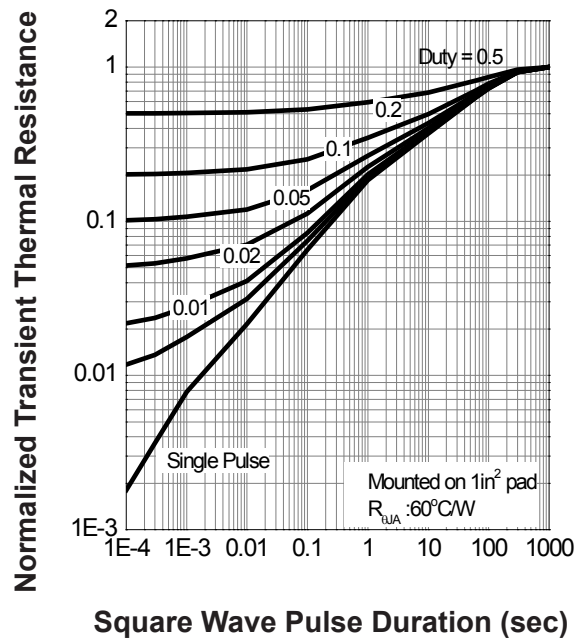
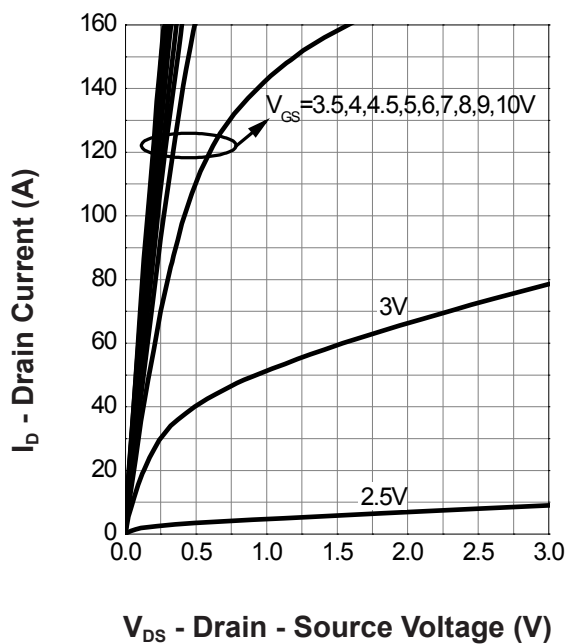
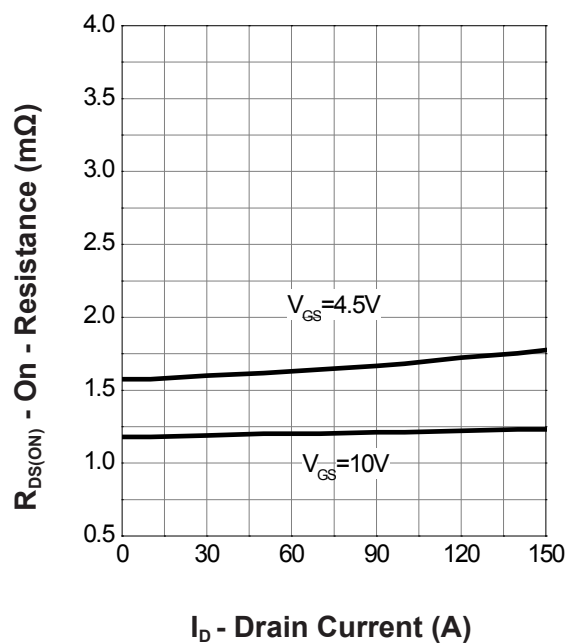
V_{GS} - Gate - Source Voltage (V)

Gate Threshold Voltage

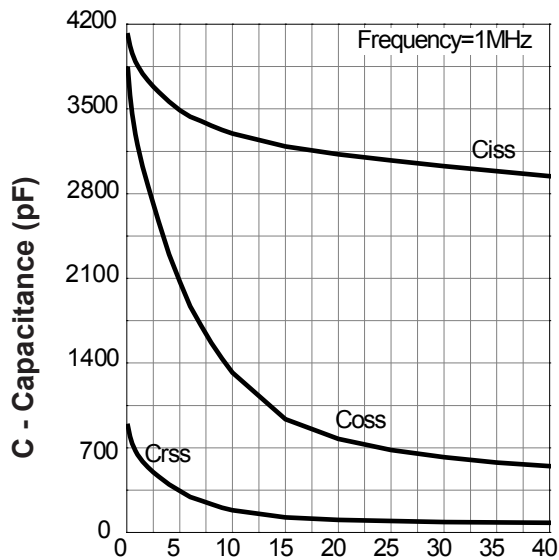
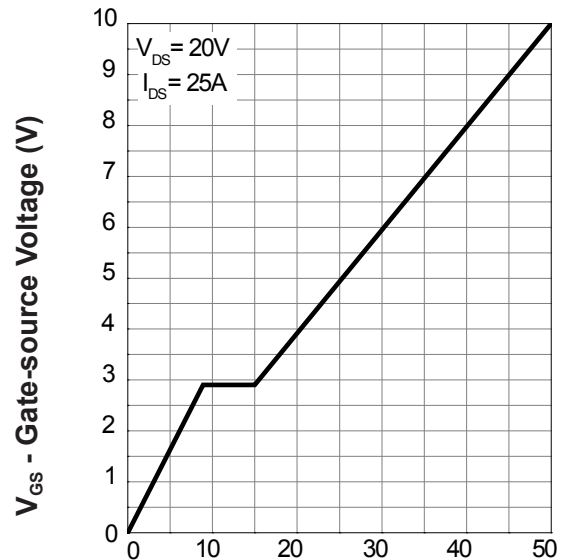
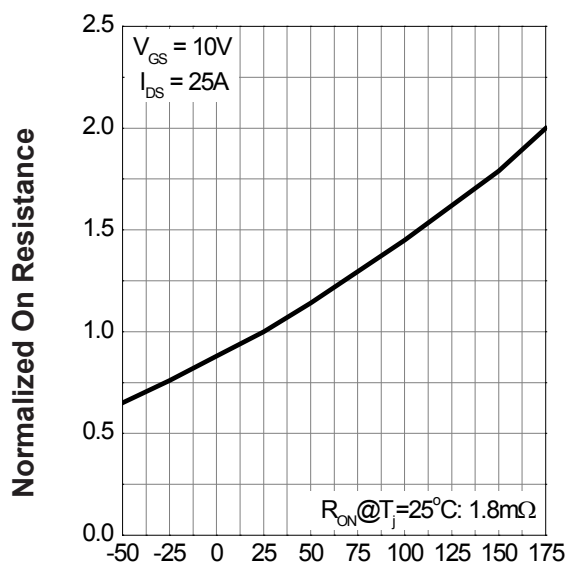
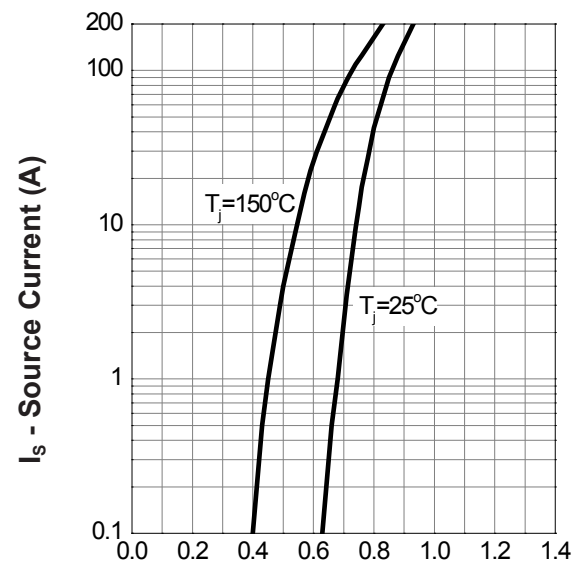


T_j - Junction Temperature ($^{\circ}\text{C}$)

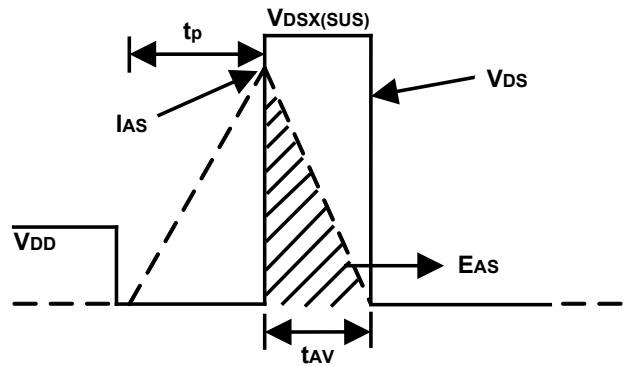
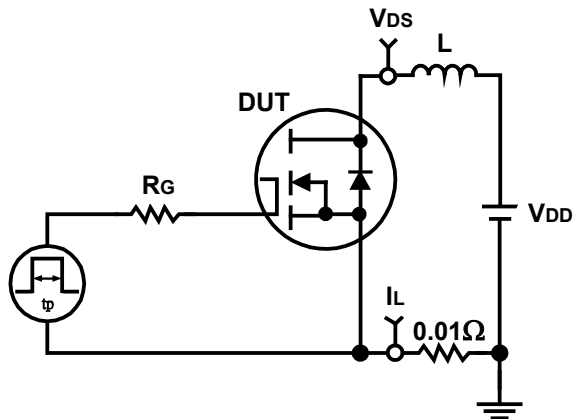
Typical Operating Characteristics(Cont.)

Safe Operation Area

Thermal Transient Impedance

Output Characteristics

Drain-Source On Resistance


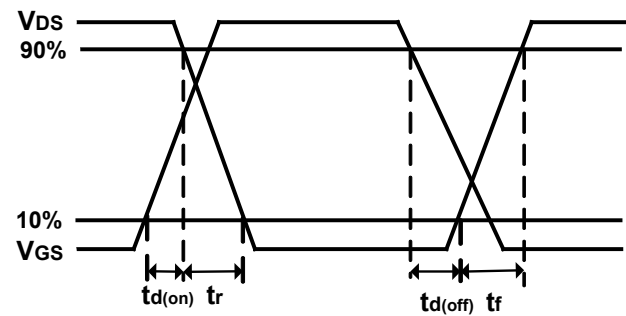
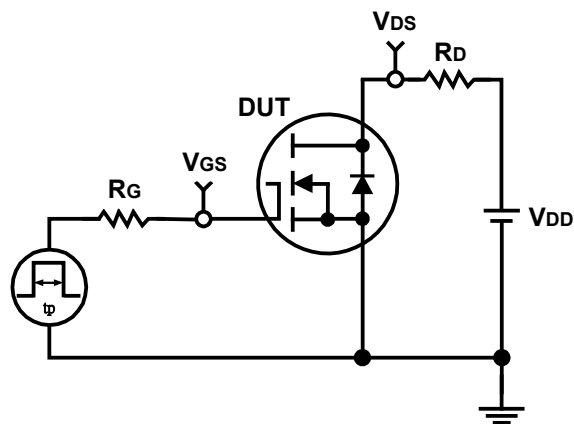
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

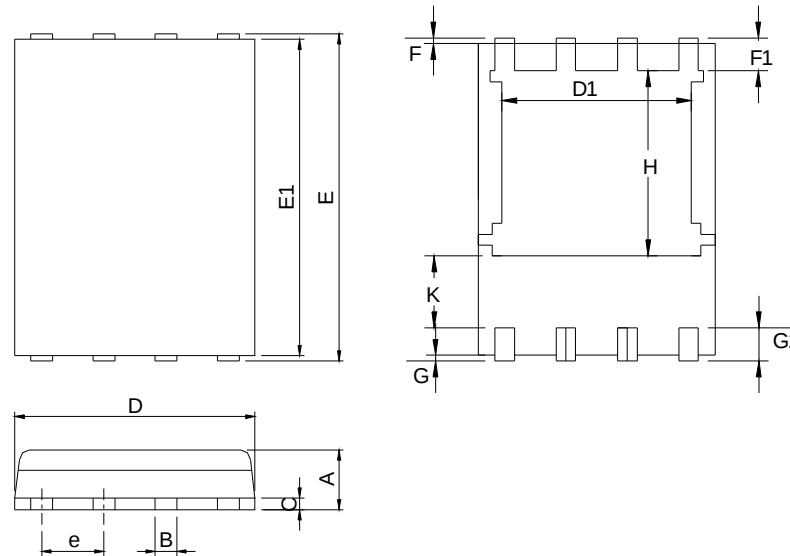


Switching Time Test Circuit and Waveforms



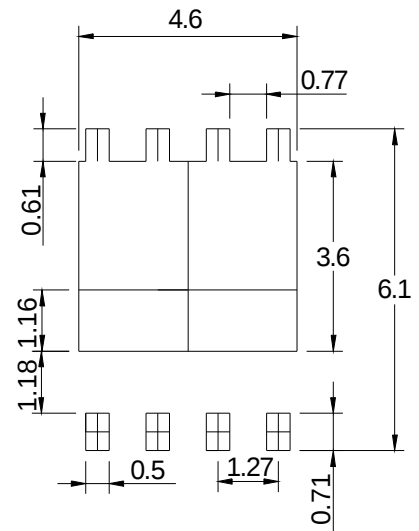
Package Information

PDFN5*6-8L



SYMBOL	PDFN5*6-8L			
	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.