

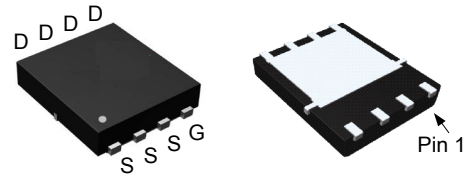
Features

- 40V/120A,
 $R_{DS(ON)} = 2.5m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 3.5m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

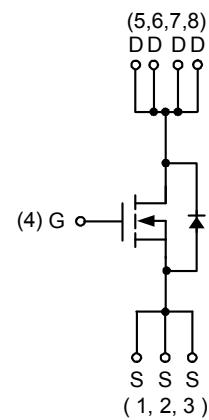
Applications

- SMPS Synchronous Rectification
- DC-DC Conversion
- Or-ing

Pin Description



PDFN5*6-8L



N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)				
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	120	A
I _D	Continuous Drain Current	T _C =25°C	120	
		T _C =100°C	90	
I _{DM}	Pulsed Drain Current	T _C =25°C	360	
P _D	Maximum Power Dissipation	T _C =25°C	104	W
		T _C =100°C	41	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	1.2	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient	t ≤ 10s	17	°C/W
		Steady State	55	
I _{AS} ^c	Avalanche Current, Single pulse (L=0.5mH)		31	A
E _{AS} ^c	Avalanche Energy, Single pulse (L=0.5mH)		240	mJ

Note a Package is limited to 100A.

Note b Pulse width limited by max. junction temperature.

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

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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	$V_{GS}=0\text{V}$, $I_{DS}=250\mu\text{A}$	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=32\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
		$T_J=85^{\circ}\text{C}$	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_{DS}=250\mu\text{A}$	1.5	1.8	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0\text{V}$	-	-	± 100	nA
$R_{DS(ON)}^d$	Drain-Source On-state Resistance	$V_{GS}=10\text{V}$, $I_{DS}=30\text{A}$	-	2.5	2.8	m Ω
		$T_J=125^{\circ}\text{C}$	-	2.8	-	
		$V_{GS}=4.5\text{V}$, $I_{DS}=20\text{A}$	-	3.5	3.8	
Gfs	Forward Transconductance	$V_{DS}=5\text{V}$, $I_{DS}=20\text{A}$	-	55	-	S

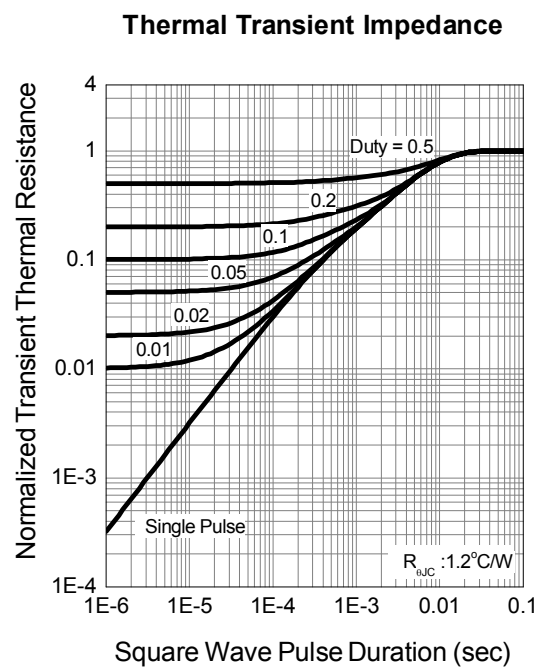
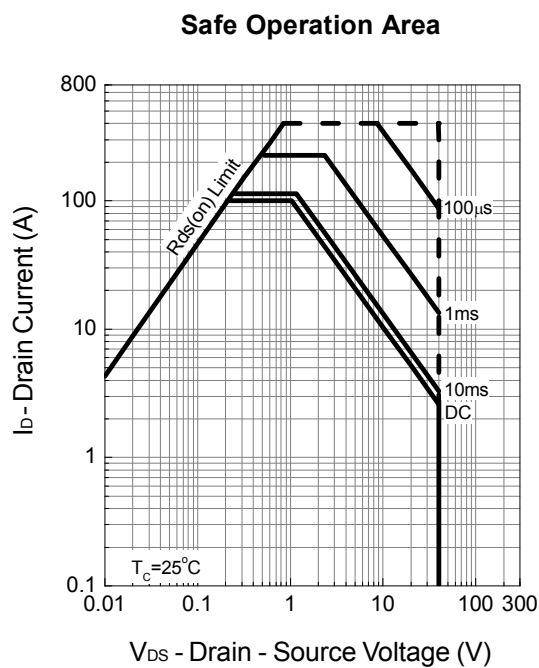
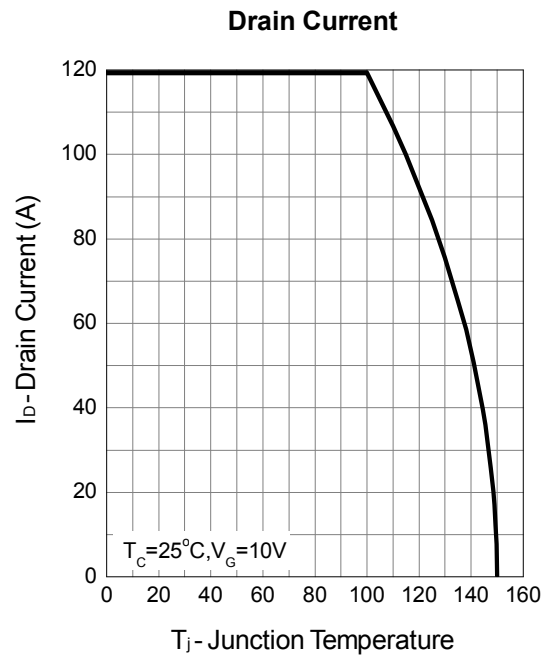
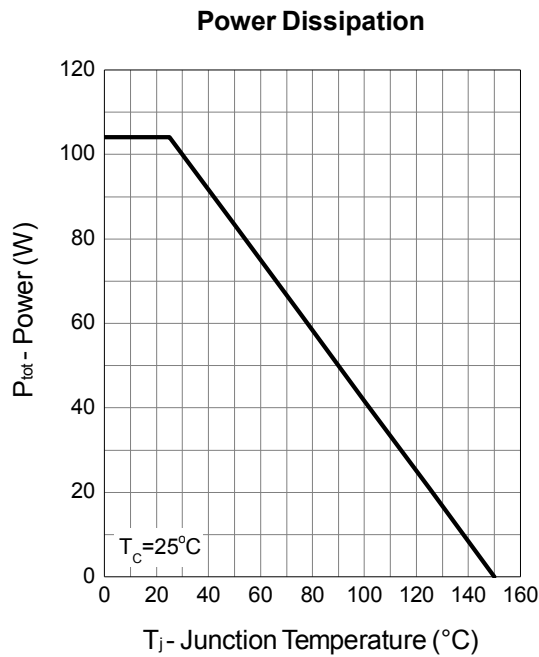
Electrical Characteristics (Cont.) ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Diode Characteristics						
V_{SD}^d	Diode Forward Voltage	$I_{SD}=20A, V_{GS}=0V$	-	0.77	1.1	V
t_{rr}	Reverse Recovery Time	$I_{SD}=20A, V_{DD}=20V$ $dI_{SD}/dt=100A/\mu s$	-	31	-	ns
t_a	Charge Time		-	18	-	
t_b	Discharge Time		-	13	-	
Q_{rr}	Reverse Recovery Charge		-	26	-	nC
Dynamic Characteristics ^e						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	0.7	1.1	2	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=20V,$ Frequency=1.0MHz	1450	2330	3220	pF
C_{oss}	Output Capacitance		580	690	800	
C_{rss}	Reverse Transfer Capacitance		300	370	450	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=20V, R_L=15\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=1\Omega$	-	20	24	ns
t_r	Turn-on Rise Time		-	10	12	
$t_{d(OFF)}$	Turn-off Delay Time		-	58	69	
t_f	Turn-off Fall Time		-	34	40	
Gate Charge Characteristics ^e						
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=4.5V,$ $I_{DS}=40A$	-	35	42	nC
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=10V,$ $I_{DS}=40A$	-	76	91	
Q_{gth}	Threshold Gate Charge		-	5.2	6.2	
Q_{gs}	Gate-Source Charge		-	12	14.4	
Q_{gd}	Gate-Drain Charge		-	15.5	18.6	

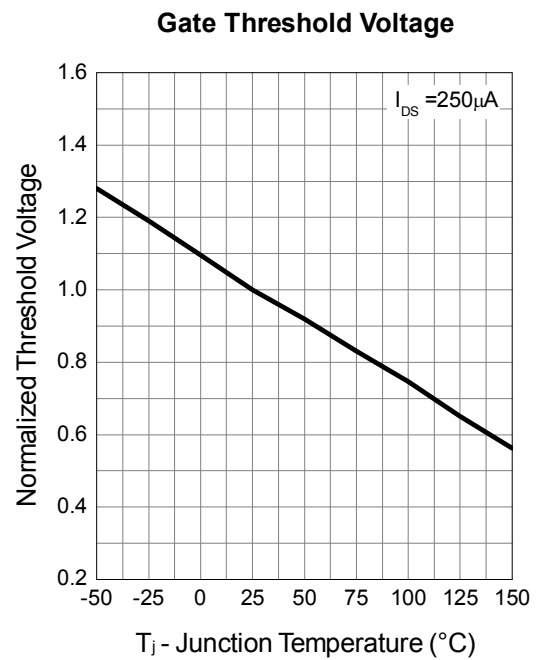
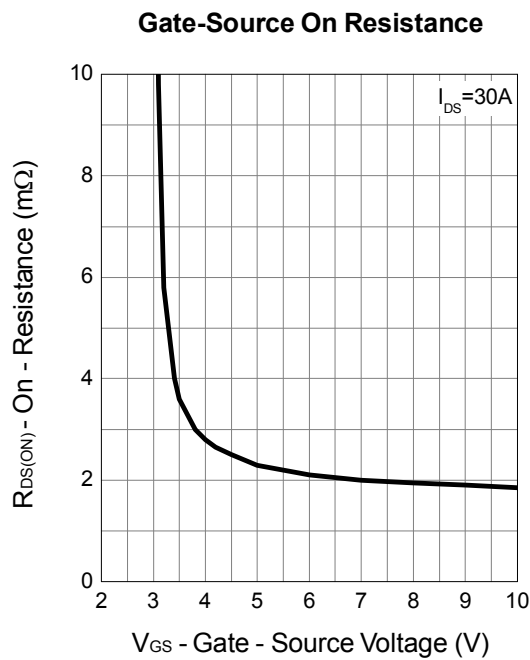
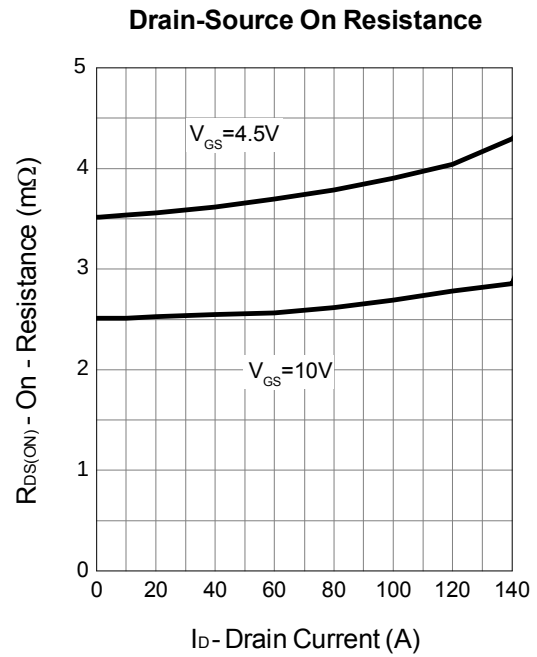
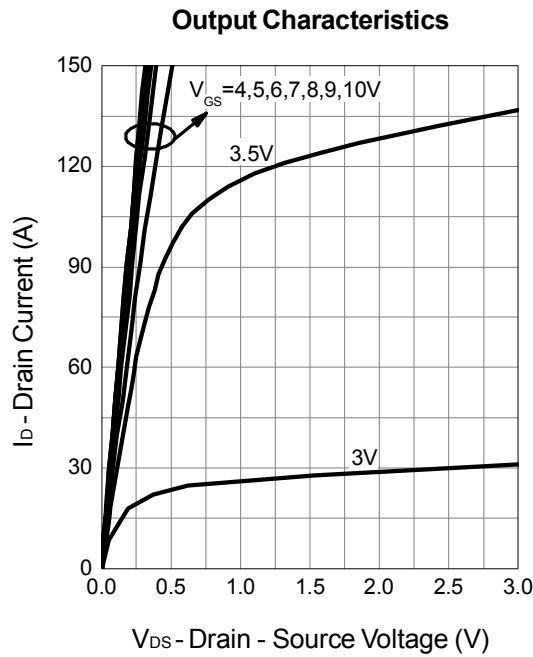
Note d : Pulse test ; pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

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

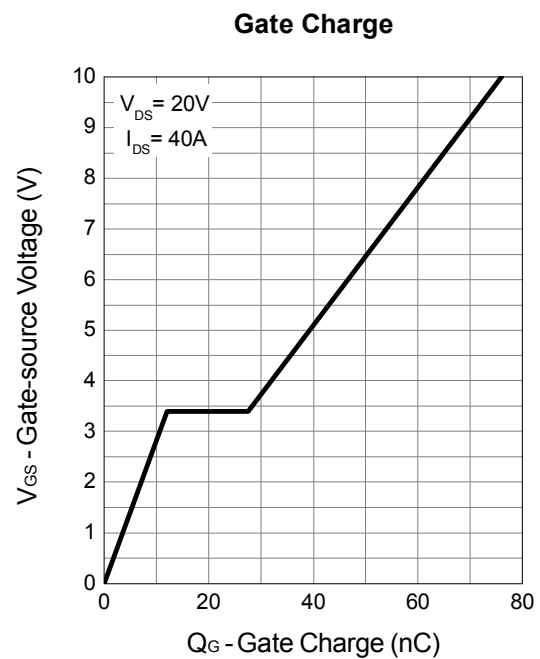
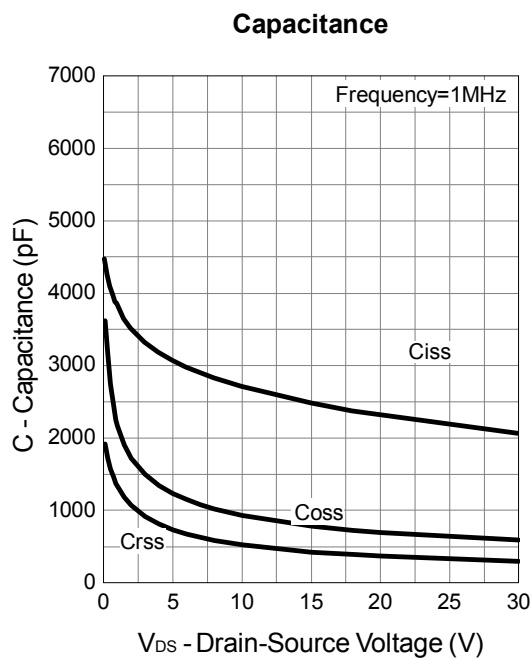
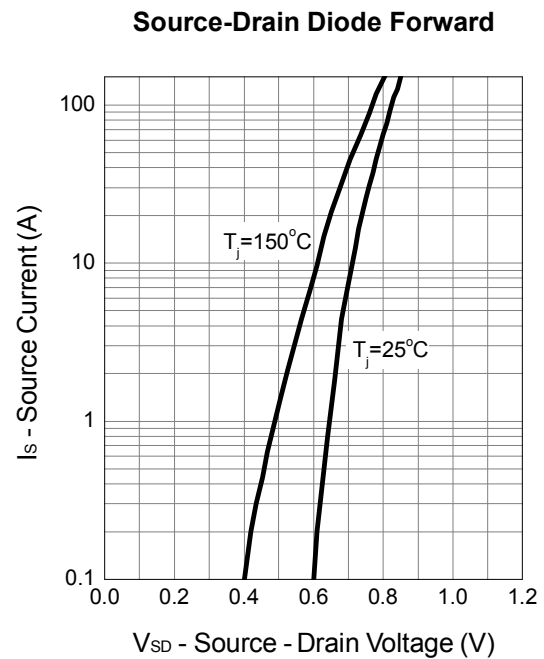
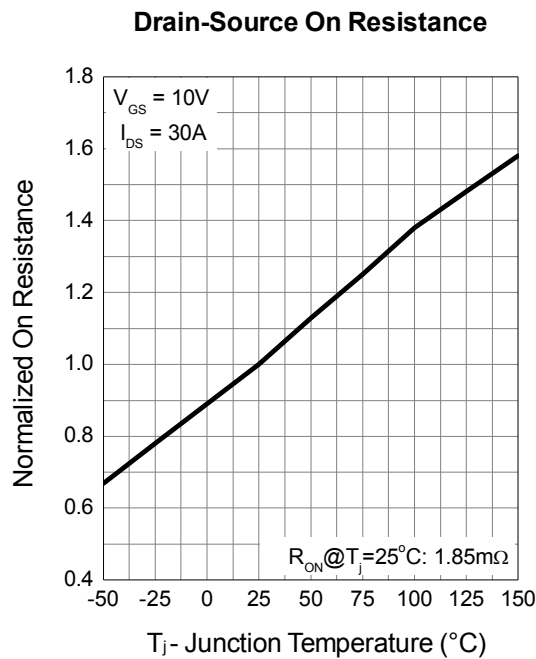
Typical Operating Characteristics



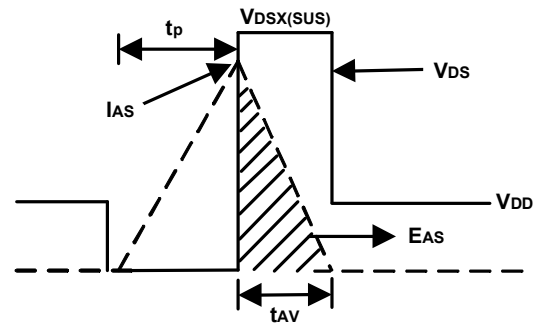
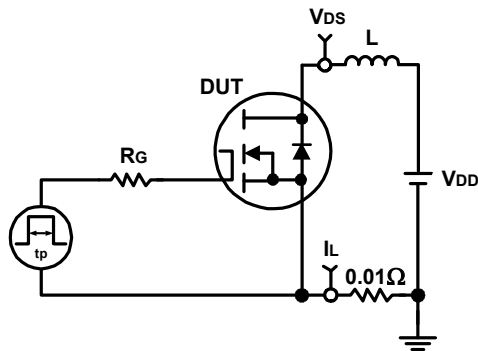
Typical Operating Characteristics (Cont.)



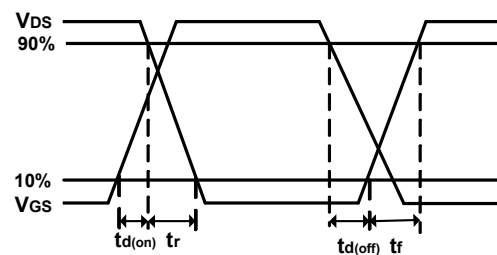
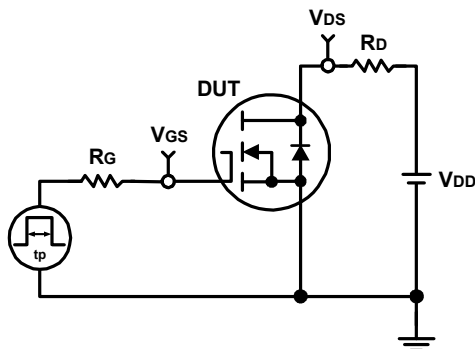
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

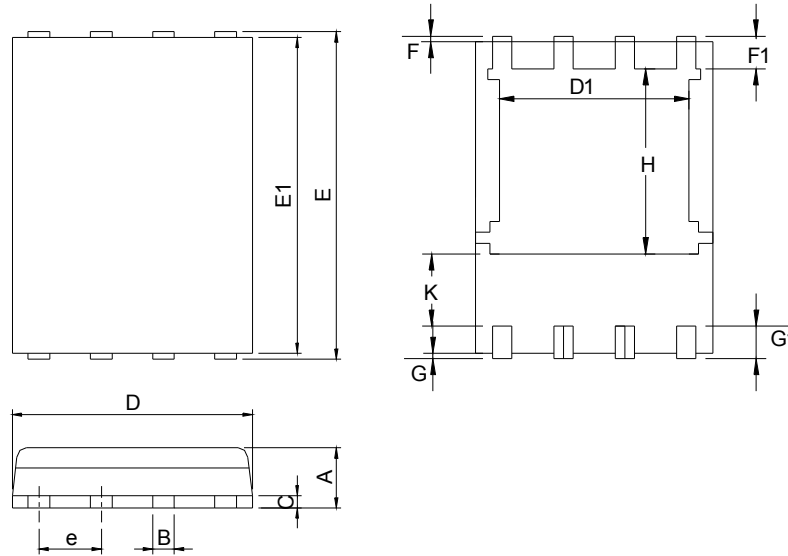


Switching Time Test Circuit and Waveforms



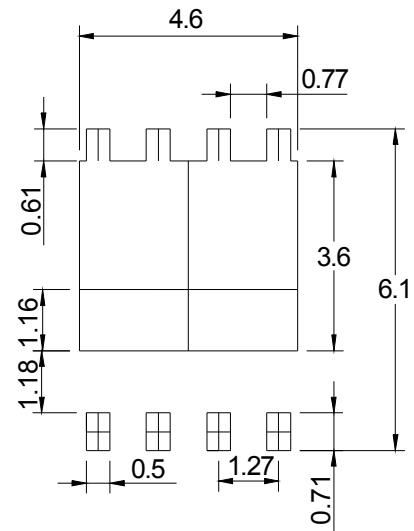
Package Information

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.