

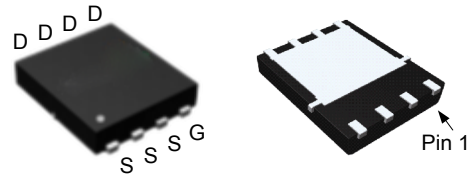
Features

- 30V/180A,
 $R_{DS(ON)} = 1.1m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 1.5m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- 100% UIS + R_g 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)

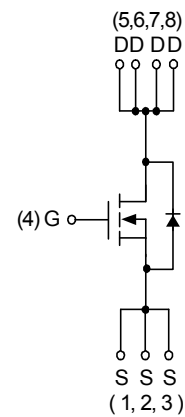
Applications

- OR-ing.
- Synchronous Rectifier for Server.
- Battery Charger and Power Circuits.

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		30	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	180	A
I _D ^a	Continuous Drain Current	T _C =25°C	180	
		T _C =100°C	120	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	400	
P _D	Maximum Power Dissipation	T _C =25°C	86.8	W
		T _C =100°C	34.7	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	1.44	°C/W
I _D ^c	Continuous Drain Current	T _A =25°C	34	A
		T _A =70°C	27	
P _D ^c	Maximum Power Dissipation	T _A =25°C	1.9	W
		T _A =70°C	1.2	
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	24	°C/W
		Steady State	65	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	125	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	782	mJ

Note a,* : Max. continue current is limited by bonding wire.

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

Note c : $R_{\theta JA}$ steady state $t = 999\text{s}$.

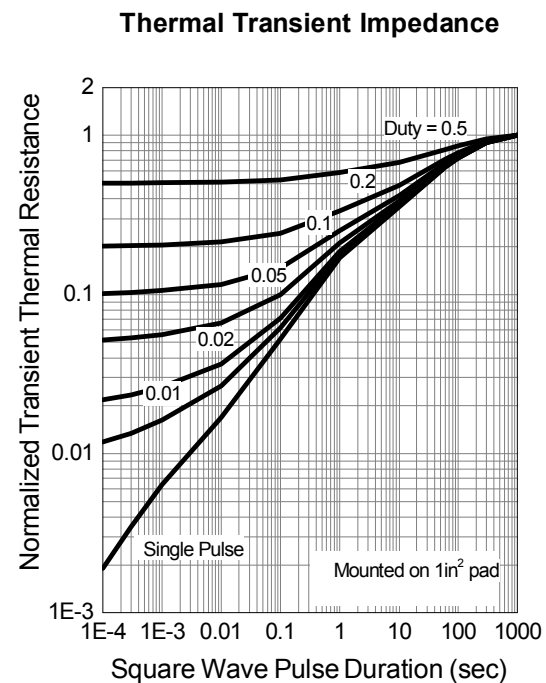
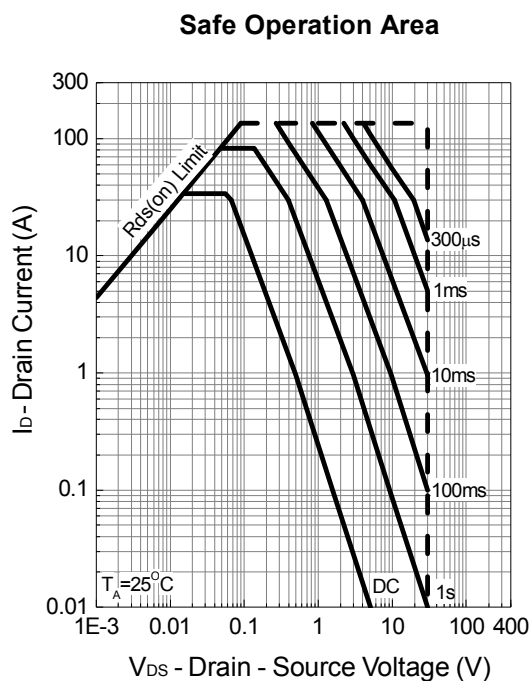
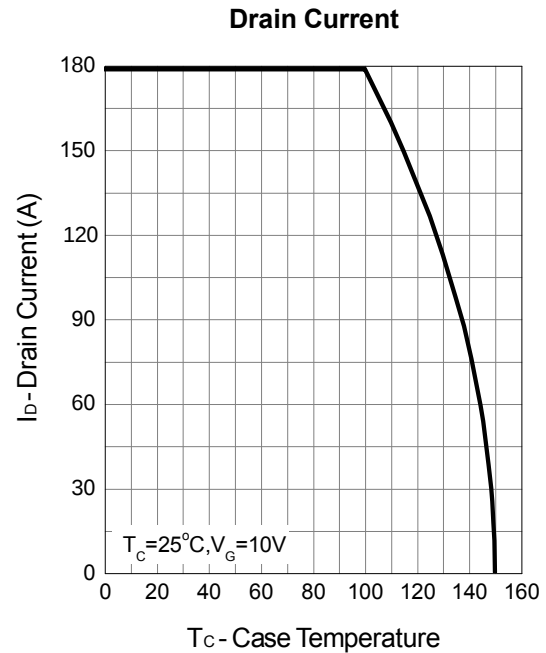
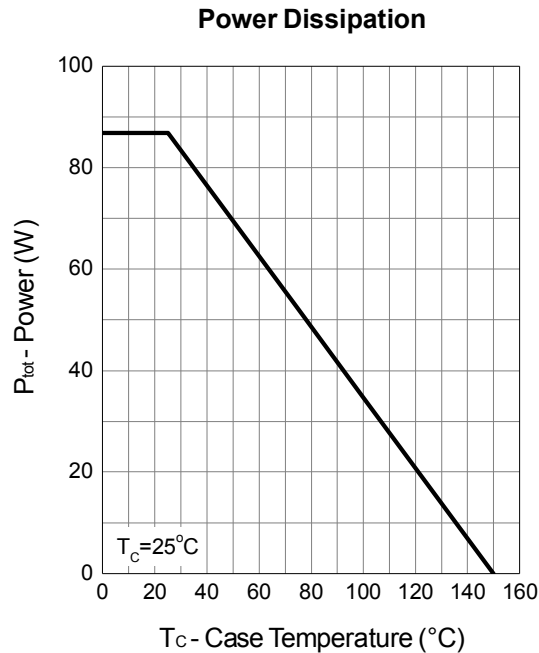
Note d : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).

Electrical Characteristics (T_A = 25°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	30	-	-	V
BV _{DSS} t	Drain-Source Breakdown Voltage (transient)	V _{GS} =0V, I _{D(aval)} =68A T _{case} =25°C, t _{transient} =100ns	34	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.3	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	-	1.1	1.3	mΩ
		V _{GS} =4.5V, I _{DS} =15A	-	1.5	1.9	
G _{fs}	Forward Transconductance	V _{DS} =5V, I _{DS} =20A	-	35	-	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 V _{DS} =15V	-	74	-	ns
t _a	Charge Time		-	37.5	-	
t _b	Discharge Time		-	36.5	-	
Q _{rr}	Reverse Recovery Charge		-	95.5	-	nC
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1	2.2	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	5165	-	pF
C _{oss}	Output Capacitance		-	3800	-	
C _{rss}	Reverse Transfer Capacitance		-	260	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =1Ω	-	20.6	-	ns
t _r	Turn-on Rise Time		-	11.6	-	
t _{d(OFF)}	Turn-off Delay Time		-	53.5	-	
t _f	Turn-off Fall Time		-	81.7	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =25A	-	76	99	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =25A	-	37	-	
Q _{gth}	Threshold Gate Charge		-	6.7	-	
Q _{gs}	Gate-Source Charge		-	12	-	
Q _{gd}	Gate-Drain Charge		-	11	-	

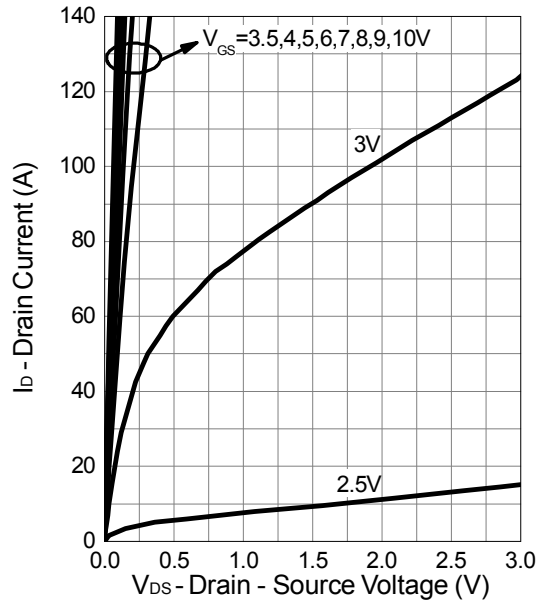
Note e : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Operating Characteristics

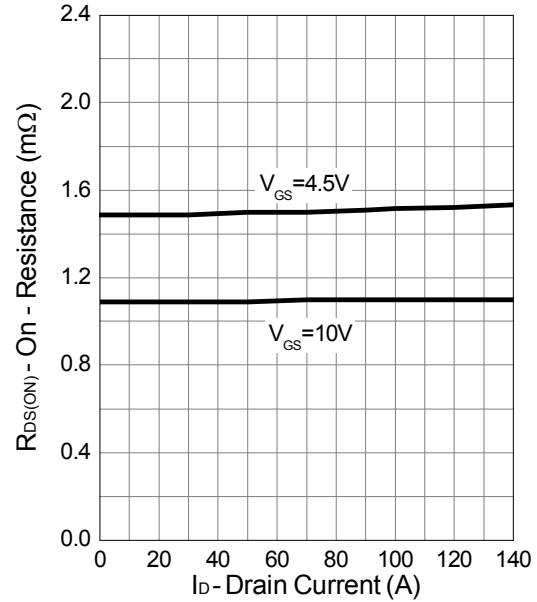


Typical Operating Characteristics (Cont.)

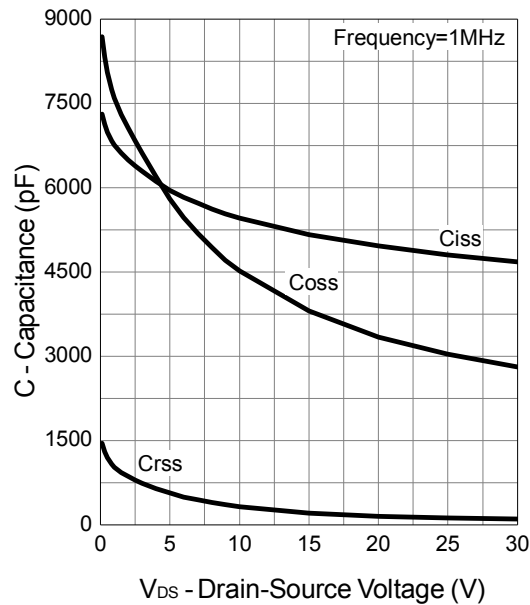
Output Characteristics



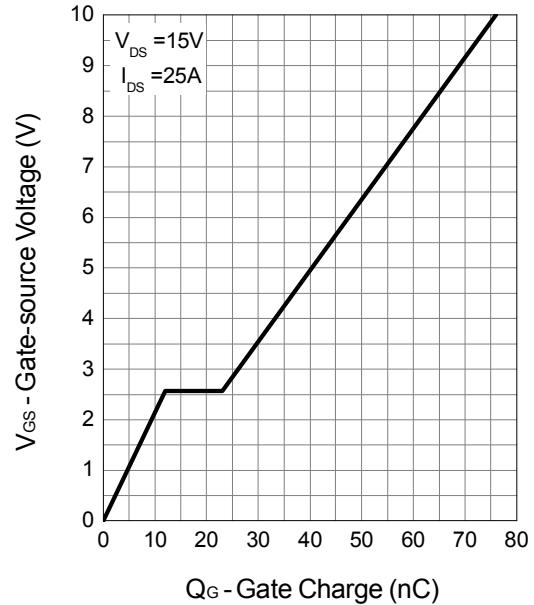
Drain-Source On Resistance



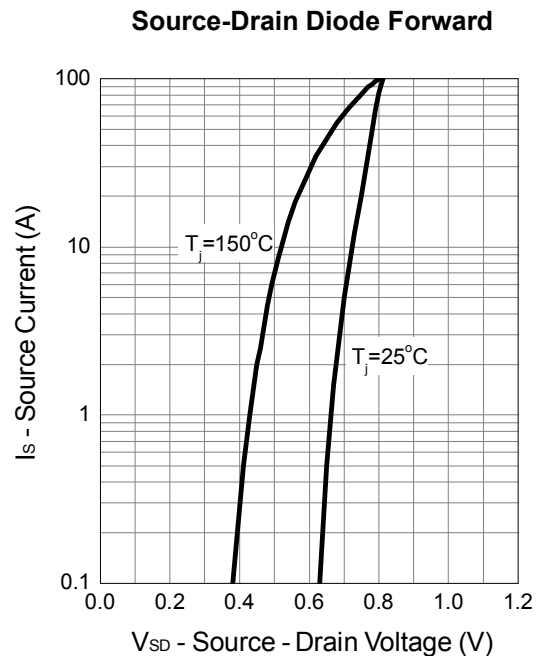
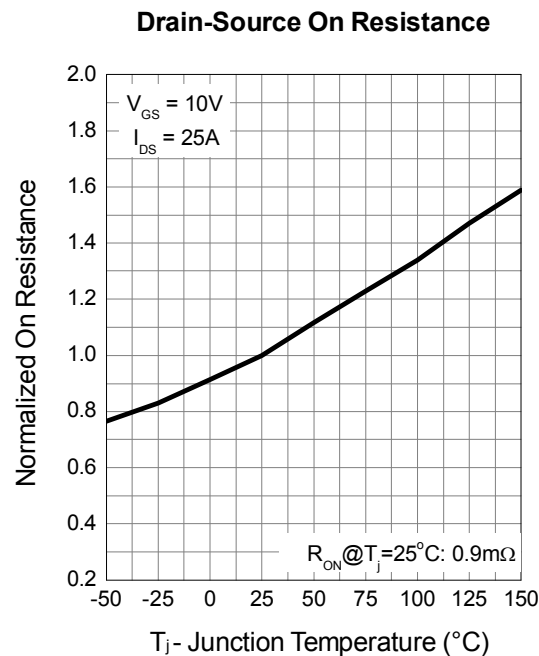
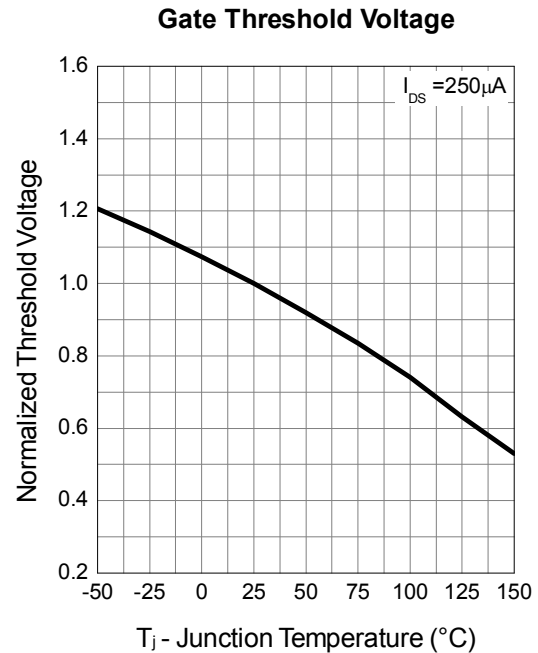
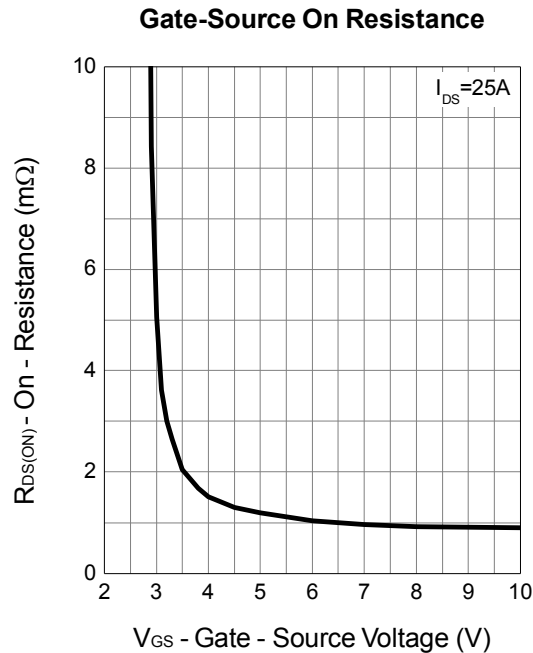
Capacitance



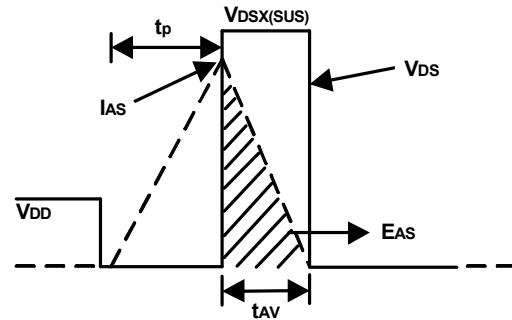
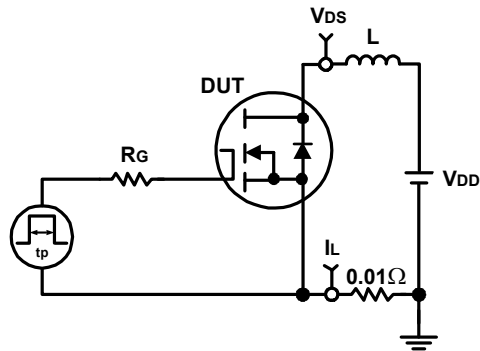
Gate Charge



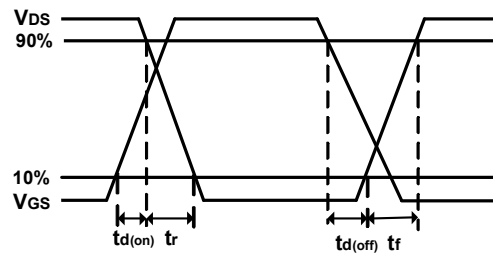
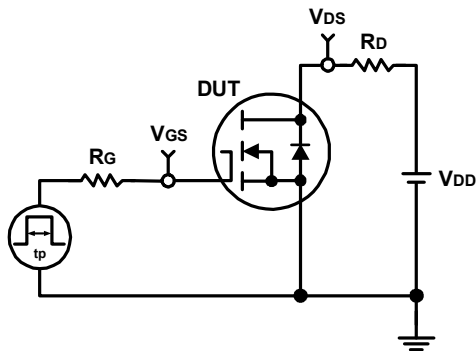
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

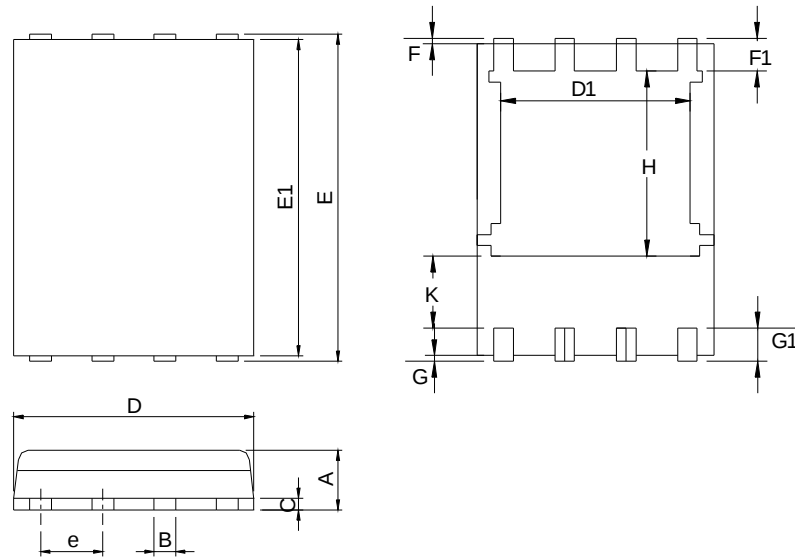


Switching Time Test Circuit and Waveforms



Package Information

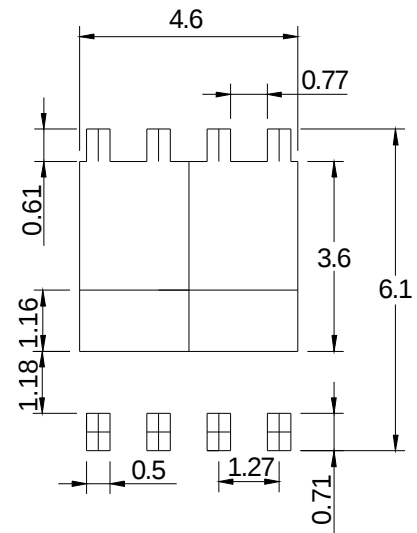
DFN5x6-8



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	-

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

RECOMMENDED LAND PATTERN



UNIT: mm