

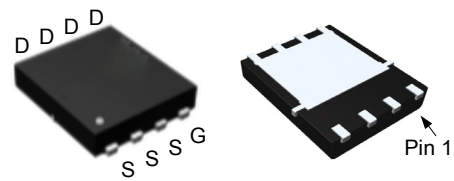
Features

- 60V/170A
 $R_{DS(ON)} = 2.8\text{m}\Omega(\text{typ.}) @ V_{GS} = 10\text{V}$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
 (RoHS Compliant)

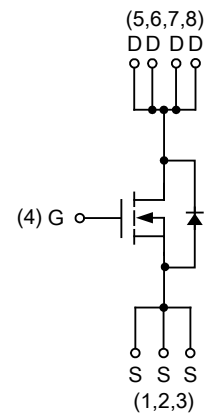
Applications

- Secondary Side Synchronous Rectification.
- DC-DC Converter.
- Motor Control.
- Load Switching.

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		60	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	85	A
I _D	Continuous Drain Current	T _C =25°C	170	
	Continuous Drain Current	T _C =100°C	125	
I _{DM}	Pulsed Drain Current	T _C =25°C	400	
P _D	Maximum Power Dissipation	T _C =25°C	176.5	W
		T _C =100°C	88.2	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	0.85	°C/W
I _D	Continuous Drain Current	T _A =25°C	20	A
		T _A =70°C	17	
P _D	Maximum Power Dissipation	T _A =25°C	2.4	W
		T _A =70°C	1.68	
R _{θJA}	Thermal Resistance-Junction to Ambient	Steady State	62.5	°C/W
I _{AS} ^b	Avalanche Current, Single pulse	L=0.5mH	62	A
E _{AS} ^b	Avalanche Energy, Single pulse	L=0.5mH	961	mJ

Note * : Current limited by bonding wire. Bonding wire limitation current is 120A.

Note a : Pulse width limited by maximum junction temperature.

Note b : 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)

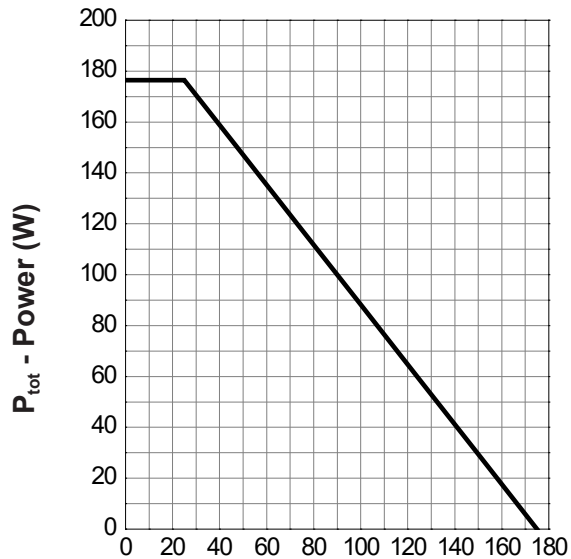
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =48V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =40A	-	2.8	3.1	mΩ
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =40A, dI _{SD} /dt=100A/μs	-	52	-	ns
Q _{rr}	Reverse Recovery Charge		-	62	-	nC
Dynamic Characteristics ^d						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	1	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz	-	4045	4630	pF
C _{oss}	Output Capacitance		-	876	-	
C _{rss}	Reverse Transfer Capacitance		-	20	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =30Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	24	43	ns
t _r	Turn-on Rise Time		-	15	27	
t _{d(OFF)}	Turn-off Delay Time		-	67	121	
t _f	Turn-off Fall Time		-	148	266	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _{DS} =40A	-	77	108	nC
Q _{gs}	Gate-Source Charge		-	23.5	-	
Q _{gd}	Gate-Drain Charge		-	18.5	-	

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

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

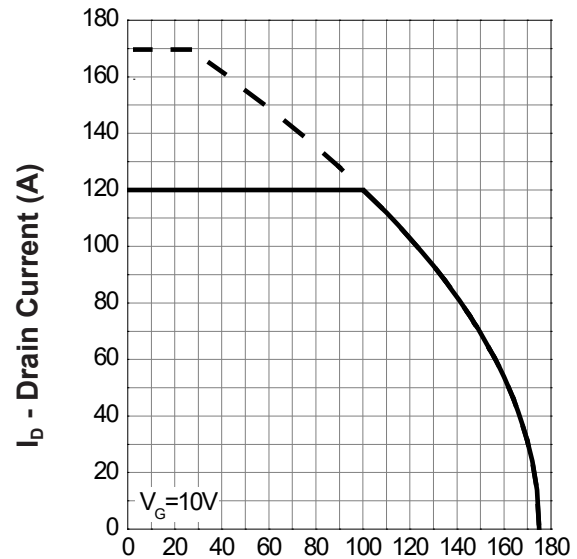
Typical Operating Characteristics

Power Dissipation



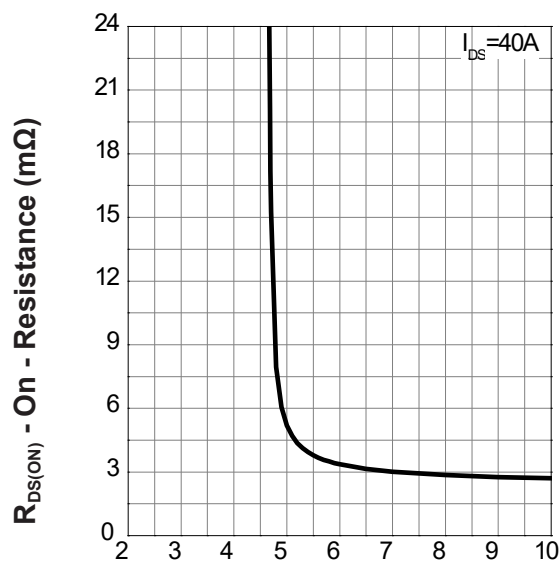
T_c - Case Temperature (°C)

Drain Current



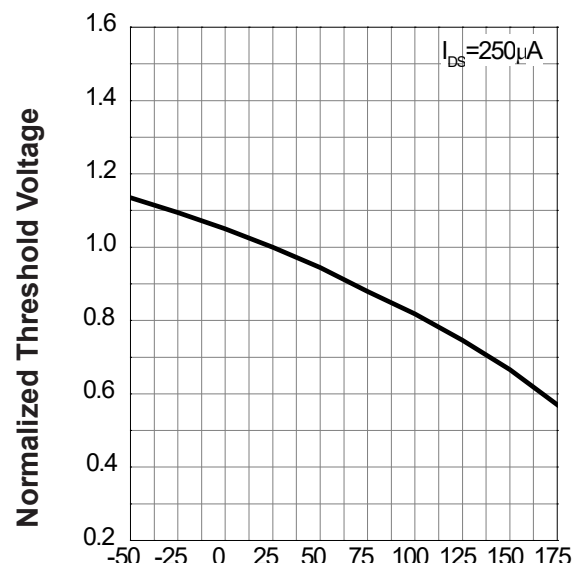
T_c - Case Temperature (°C)

Gate-Source On Resistance



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

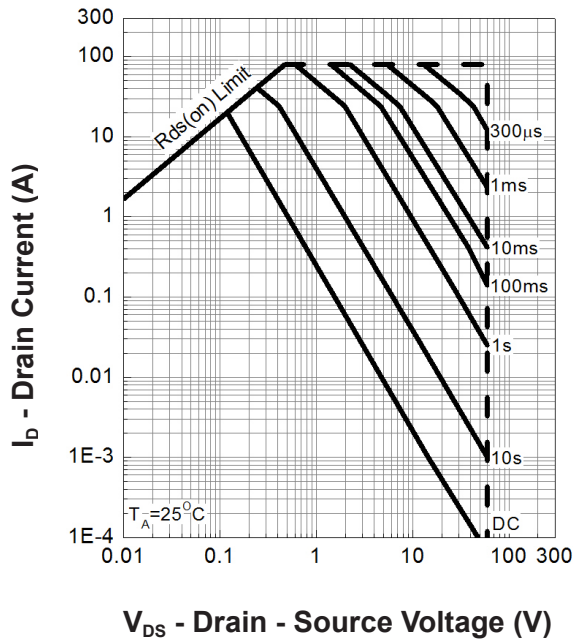
Gate Threshold Voltage



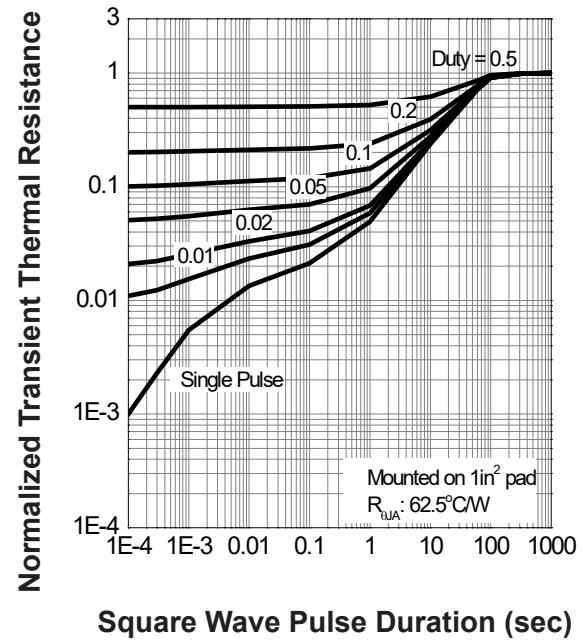
T_J - Junction Temperature (°C)

Typical Operating Characteristics(Cont.)

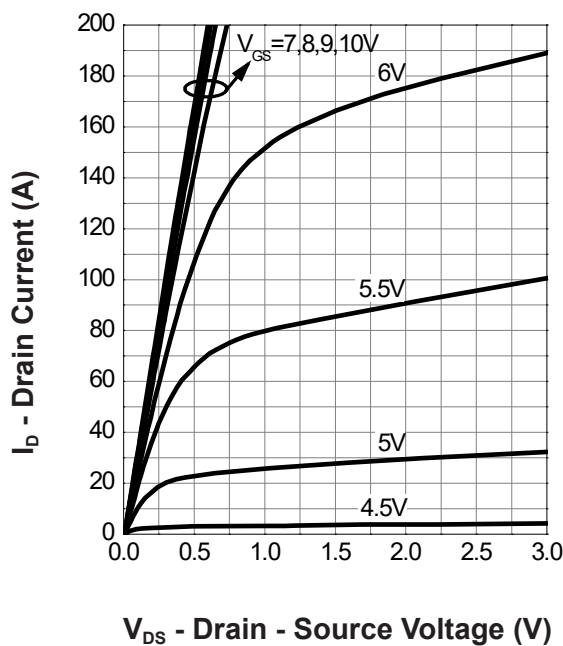
Safe Operation Area



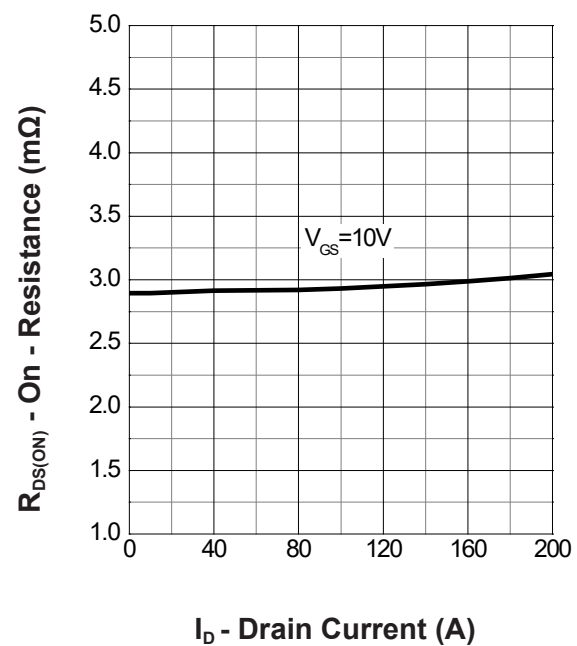
Thermal Transient Impedance



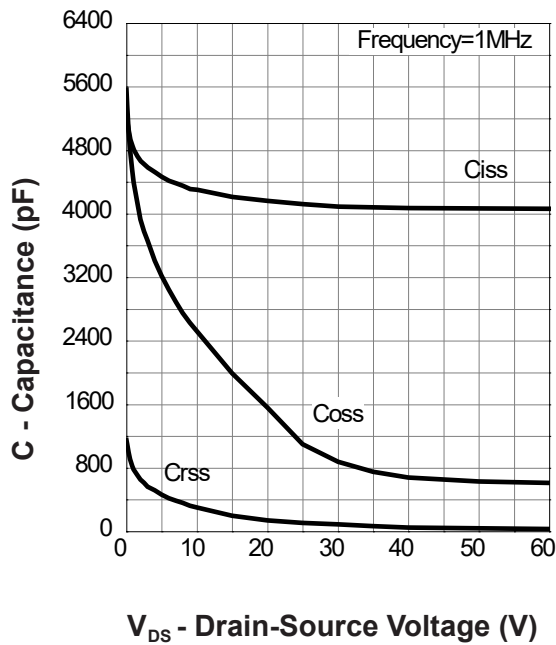
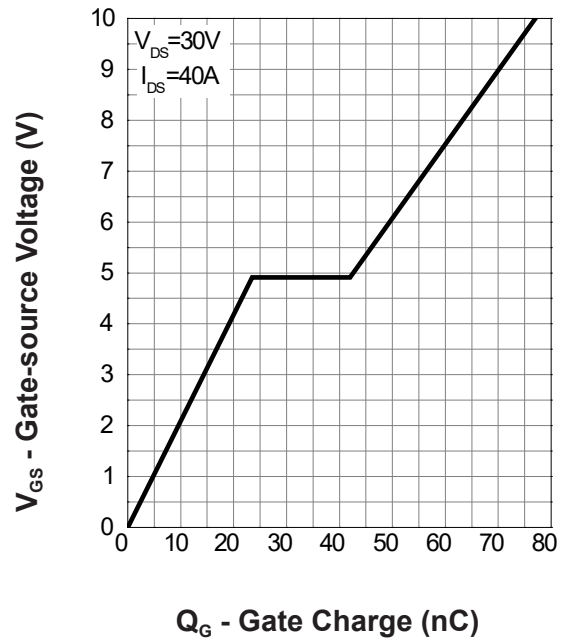
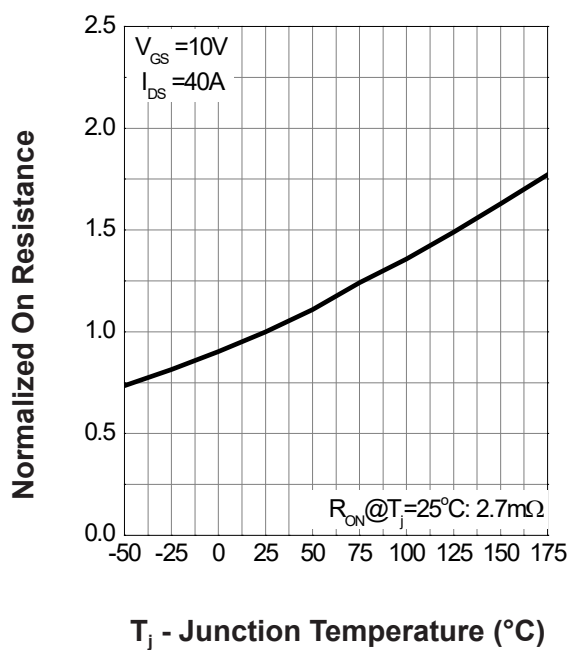
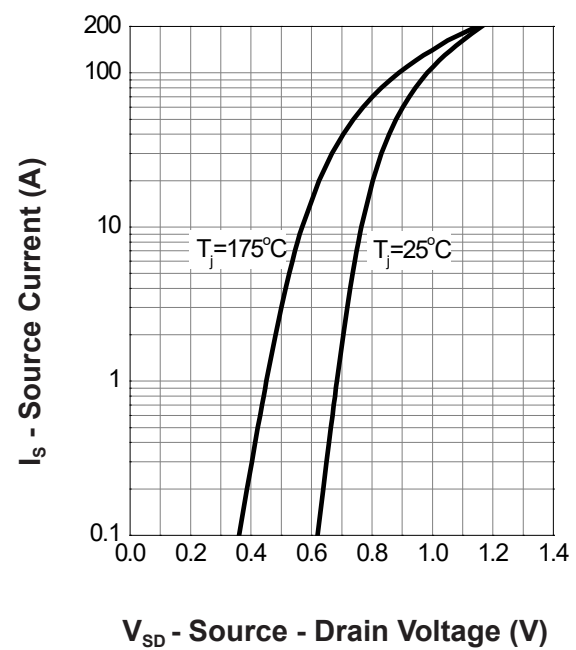
Output Characteristics



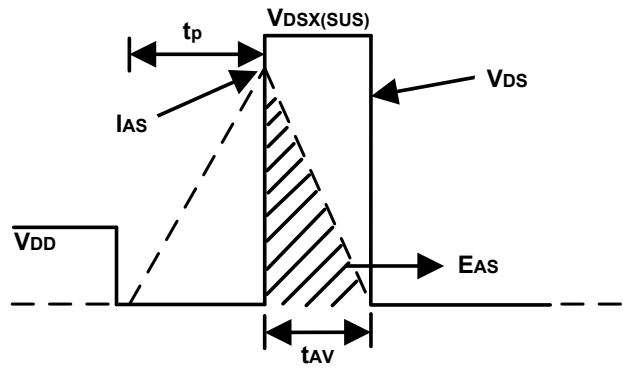
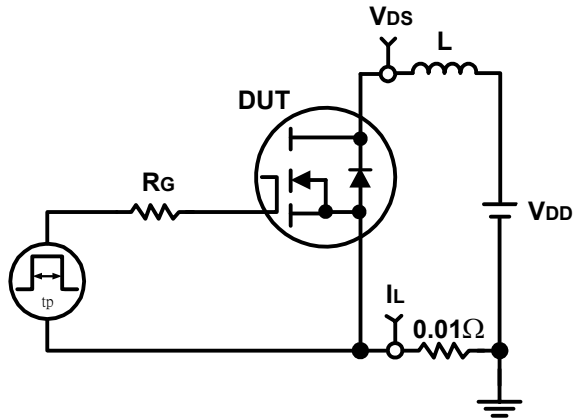
Drain-Source On Resistance



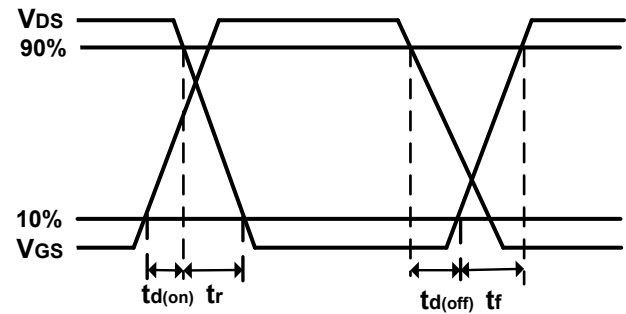
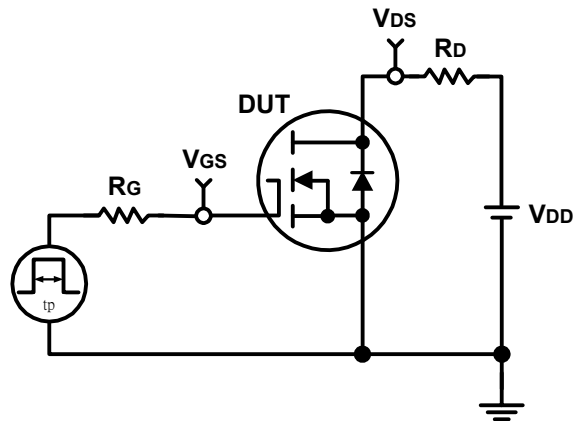
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

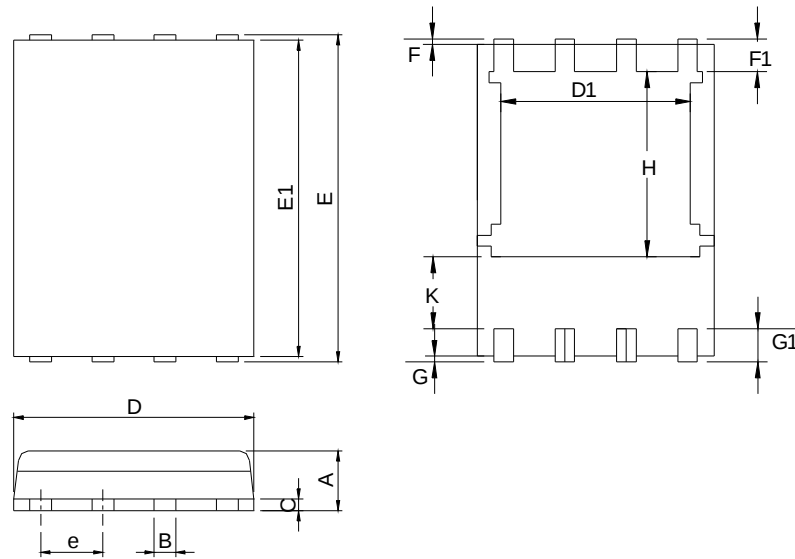


Switching Time Test Circuit and Waveforms



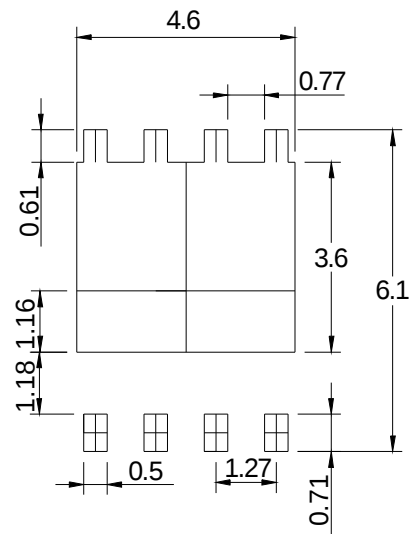
Package Information

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.