

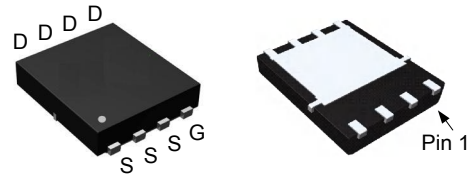
Features

- 30V/120A,
 $R_{DS(ON)} = 2.8m\Omega$ (Typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 3.8m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
- Reliable and Rugged
- Lower Q_g and Q_{gd} for high-speed switching
- Lower $R_{DS(ON)}$ to Minimize Conduction Losses
- 100% UIS + R_g Tested
- Lead Free and Green Devices Available
 (RoHS Compliant)

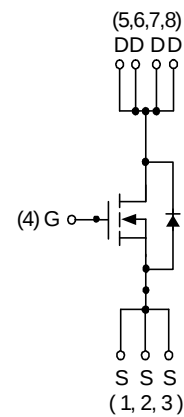
Applications

- Power Management in Desktop Computer or DC/DC Converters.
- Power Load Switch.
- Notebook Battery Management.

Pin Description



DFN5x6 8L EP1_P



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	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ 31	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ 120	
		$T_C=100^\circ\text{C}$ 74	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 56	W
		$T_C=100^\circ\text{C}$ 22	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	$^\circ\text{C/W}$
I_S	Diode Continuous Forward Current	$T_A=25^\circ\text{C}$ 1.9	A
I_D^a	Continuous Drain Current	$T_A=25^\circ\text{C}$ 22.8	
		$T_A=70^\circ\text{C}$ 18.2	
I_{DM}^b	Pulsed Drain Current	$T_A=25^\circ\text{C}$ 200	
P_D^a	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 2.08	W
		$T_A=70^\circ\text{C}$ 1.33	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$ 20	$^\circ\text{C/W}$
		Steady State 60 ^a	
I_{AS}^c	Avalanche Current, Single pulse	$L=0.1\text{mH}$ 80	A
E_{AS}^c	Avalanche Energy, Single pulse	$L=0.1\text{mH}$ 320	mJ

Note a : Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$. $R_{\theta JA}$ steady state $t=999\text{s}$.

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

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

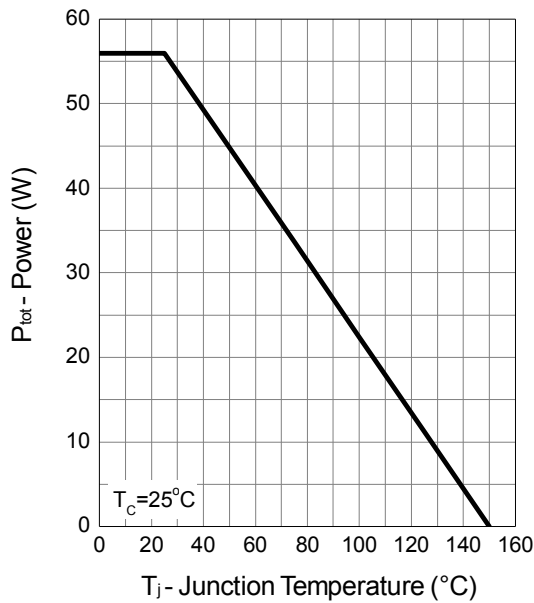
Electrical Characteristics (T_A = 25°C unless otherwise noted)

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)} =36A 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	1.0	1.6	2.0	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	μA
R _{DS(ON)} ^d	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =20A	-	2.8	3.3	mΩ
		T _J =125°C	-	3.2	-	
		V _{GS} =4.5V, I _{DS} =15A	-	3.8	4.4	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	30	-	S
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =5A, dI _{SD} /dt=100A/μs	-	39	-	ns
t _a	Charge Time		-	23	-	
t _b	Discharge Time		-	16	-	
Q _{rr}	Reverse Recovery Charge		-	33	-	
Dynamic Characteristics						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	0.9	2.1	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	1862	-	pF
C _{oss}	Output Capacitance		-	520	-	
C _{rss}	Reverse Transfer Capacitance		-	150	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	15	-	ns
t _r	Turn-on Rise Time		-	8	-	
t _{d(OFF)}	Turn-off Delay Time		-	38	-	
t _f	Turn-off Fall Time		-	54	-	
Gate Charge Characteristics						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =20A	-	30	45	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =20A	-	14	-	
Q _{gth}	Threshold Gate Charge		-	3	-	
Q _{gs}	Gate-Source Charge		-	5.3	-	
Q _{gd}	Gate-Drain Charge		-	3.6	-	

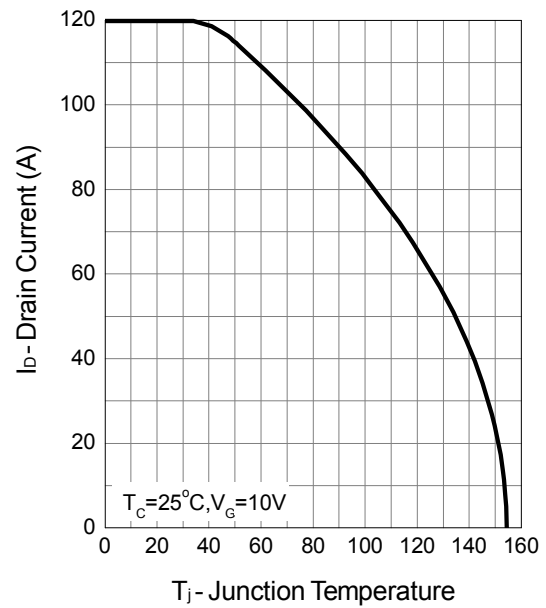
Note d : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Operating Characteristics

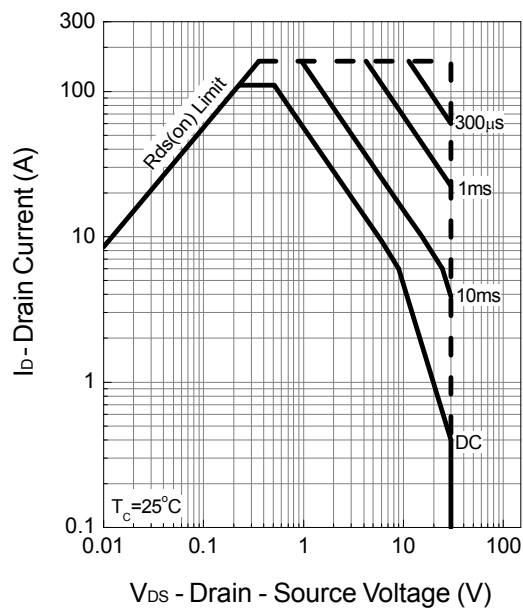
Power Dissipation



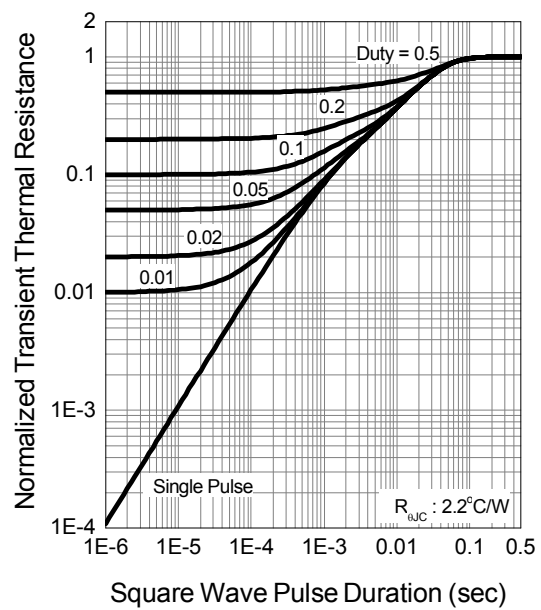
Drain Current



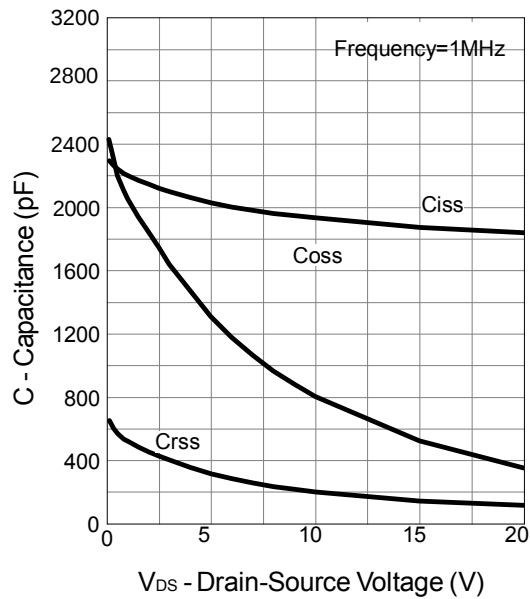
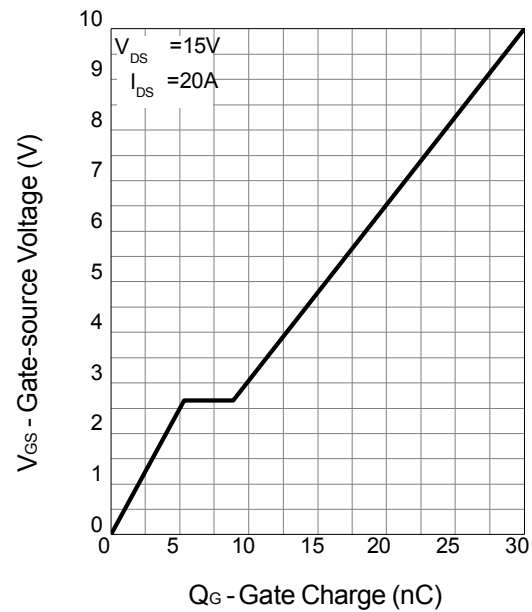
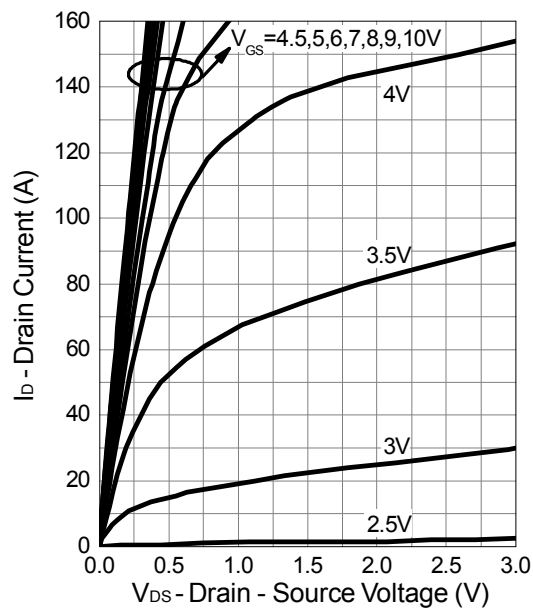
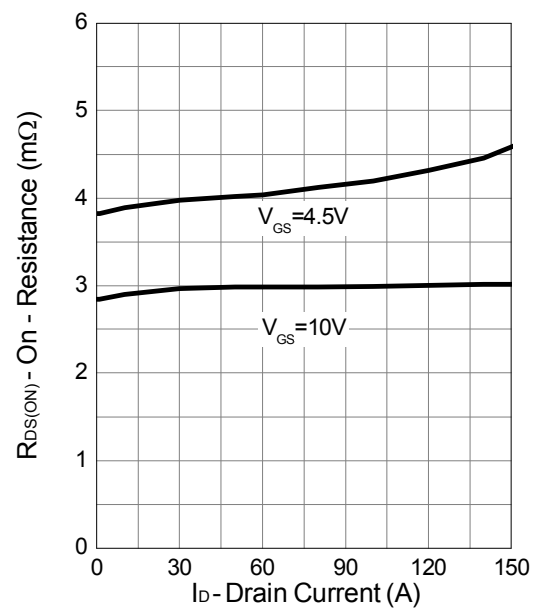
Safe Operation Area



Thermal Transient Impedance

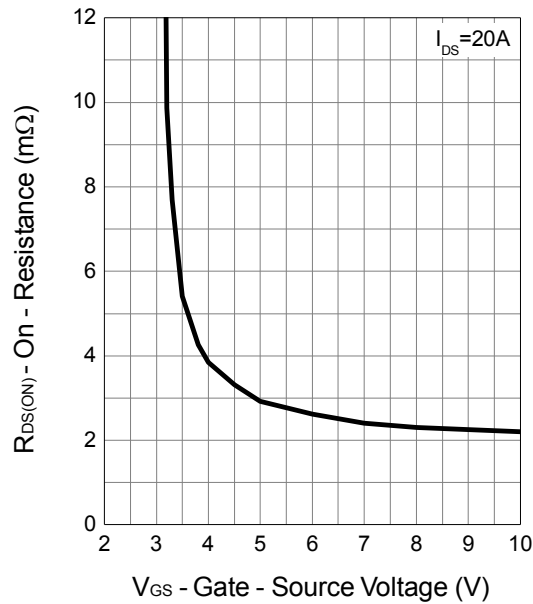


Typical Operating Characteristics (Cont.)

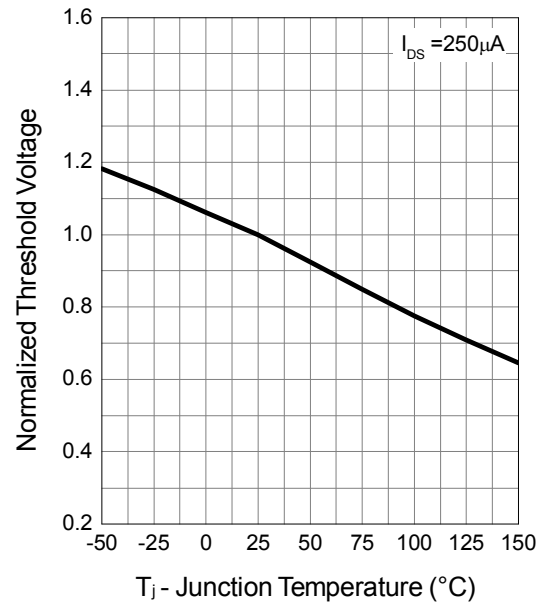
Capacitance

Gate Charge

Output Characteristics

Drain-Source On Resistance


Typical Operating Characteristics (Cont.)

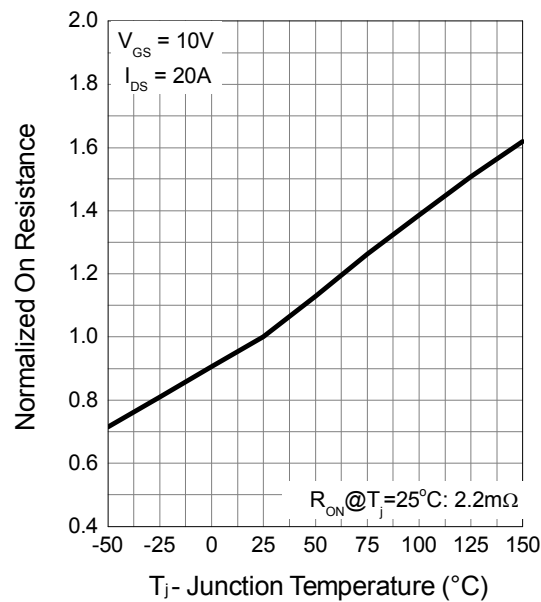
Gate-Source On Resistance



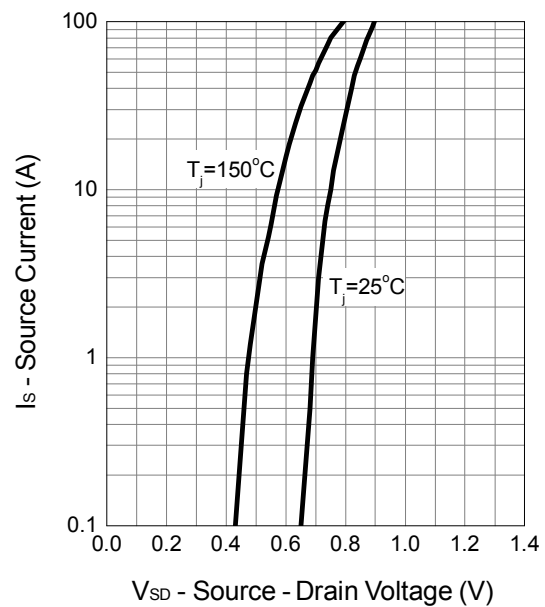
Gate Threshold Voltage



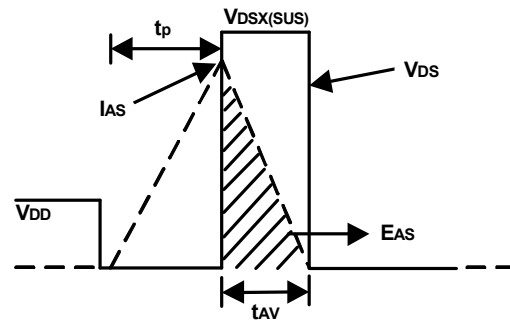
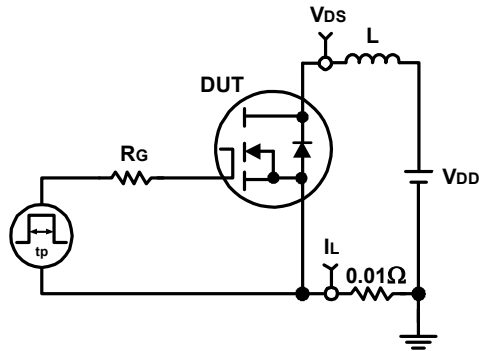
Drain-Source On Resistance



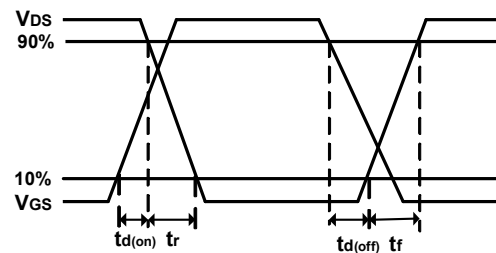
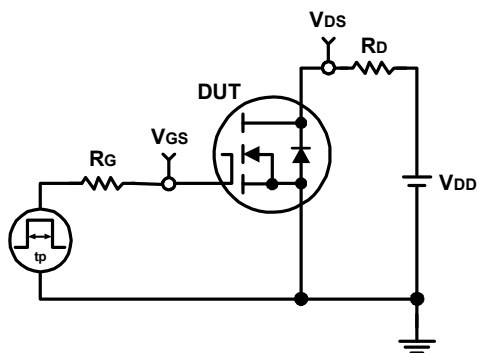
Source-Drain Diode Forward



Avalanche Test Circuit and Waveforms

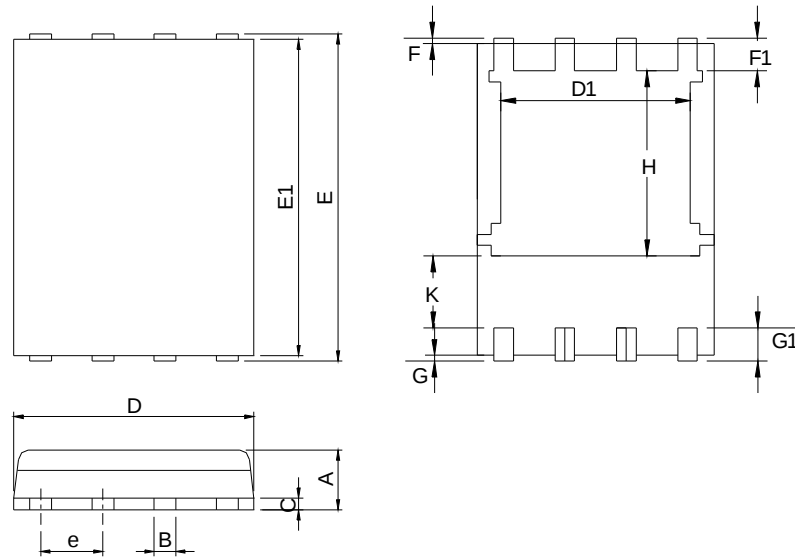


Switching Time Test Circuit and Waveforms



Package Information

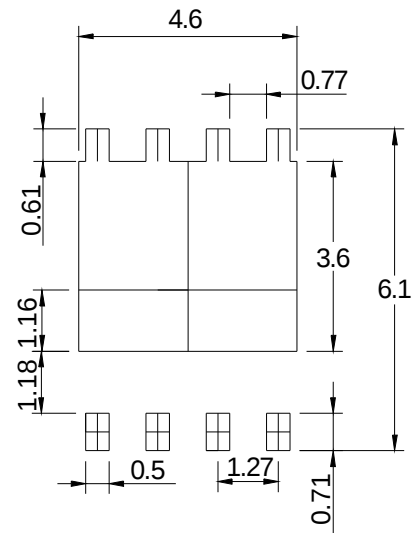
DFN5x6-8



DIMENSIONS	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