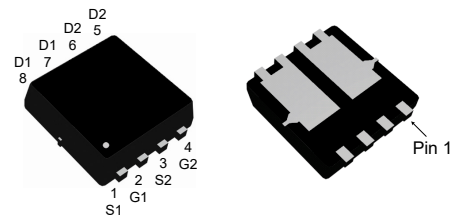


Features

- 30V/-15A
 $R_{DS(ON)} = 15m\Omega (typ.) @ V_{GS} = -10V$
 $R_{DS(ON)} = 18m\Omega (typ.) @ V_{GS} = -4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

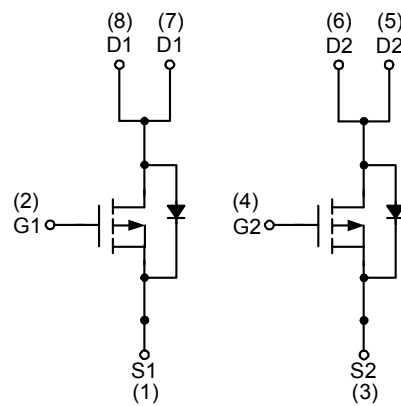
Pin Description



DFN3.3x3.3G-8_EP2

Applications

- Motor Control.
- High Current, High Speed Switching.
- Portable equipment application.



P-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	-15	A
I _D	Continuous Drain Current	T _C =25°C	-15	A
		T _C =100°C	-11.3	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	-45	A
P _D	Maximum Power Dissipation	T _C =25°C	42	W
		T _C =100°C	17	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	3	°C/W
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	43	°C/W
		Steady State	80	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.1mH	-15	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.1mH	11.25	mJ

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

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

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

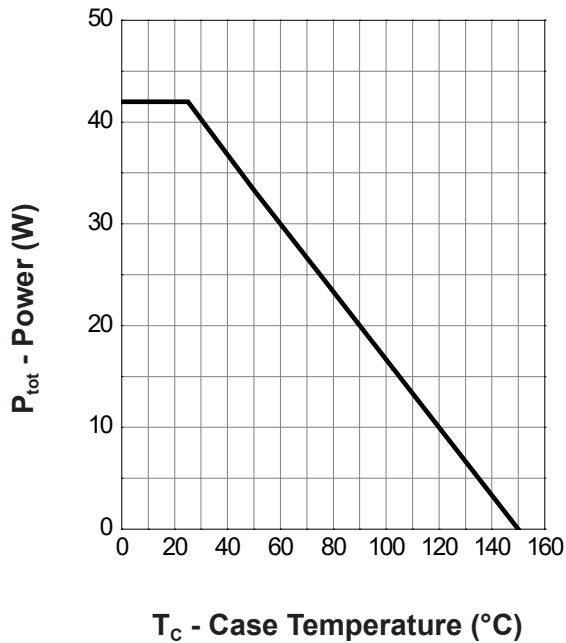
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	-30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-24V, V _{GS} =0V T _J =85°C	-	-	1 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-1.2	-1.6	-2	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} =-4A T _J =125°C	-	15 19	18 -	mΩ
		V _{GS} =-4.5V, I _{DS} =-2.4A	-	18	21	
Gfs	Forward Transconductance	V _{DS} =-5V, I _{DS} =-2.4A	-	8	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1.1	V
t _{rr}	Reverse Recovery Time	I _{SD} =-4A, dI _{SD} /dt=100A/μs	-	11	-	ns
t _a	Charge Time		-	6	-	
t _b	Discharge Time		-	5	-	
Q _{rr}	Reverse Recovery Charge		-	2	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	-	2.8	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, Frequency=1.0MHz	-	823	1070	pF
C _{oss}	Output Capacitance		-	106	-	
C _{rss}	Reverse Transfer Capacitance		-	74	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-15V, R _L =15Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	11	20	ns
t _r	Turn-on Rise Time		-	7	13	
t _{d(OFF)}	Turn-off Delay Time		-	29	53	
t _f	Turn-off Fall Time		-	6	11	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V, I _{DS} =-4A	-	14.3	21	nC
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-4.5V, I _{DS} =-4A	-	7	11	
Q _{gth}	Threshold Gate Charge		-	1	-	
Q _{gs}	Gate-Source Charge		-	2	-	
Q _{gd}	Gate-Drain Charge		-	2.5	-	

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

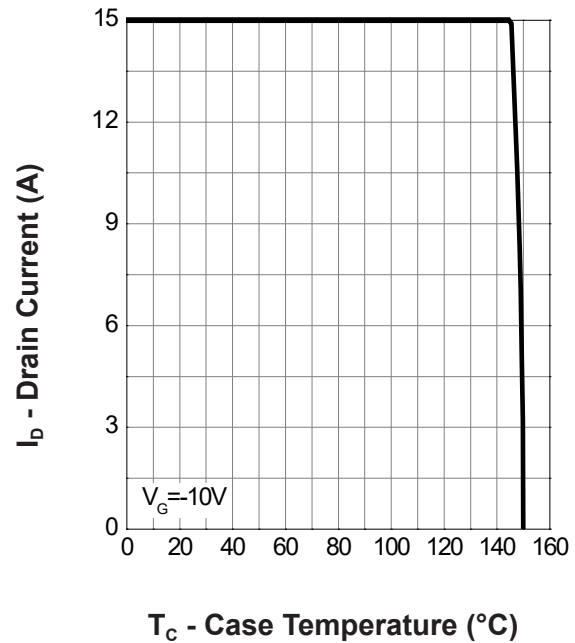
Note f : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

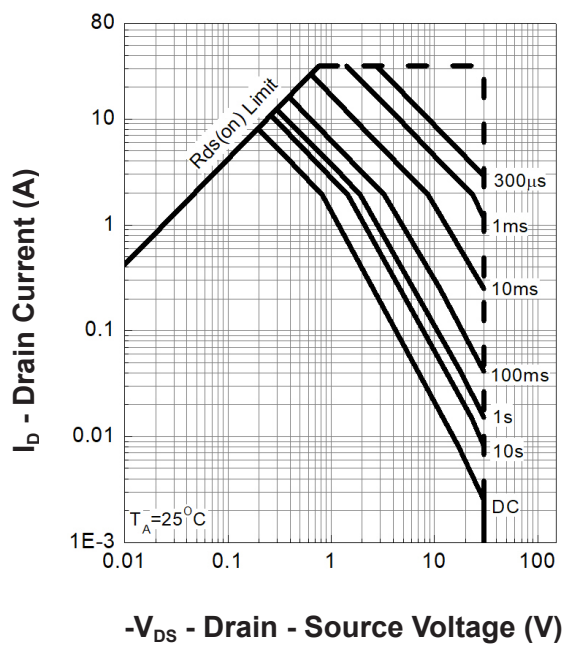
Power Dissipation



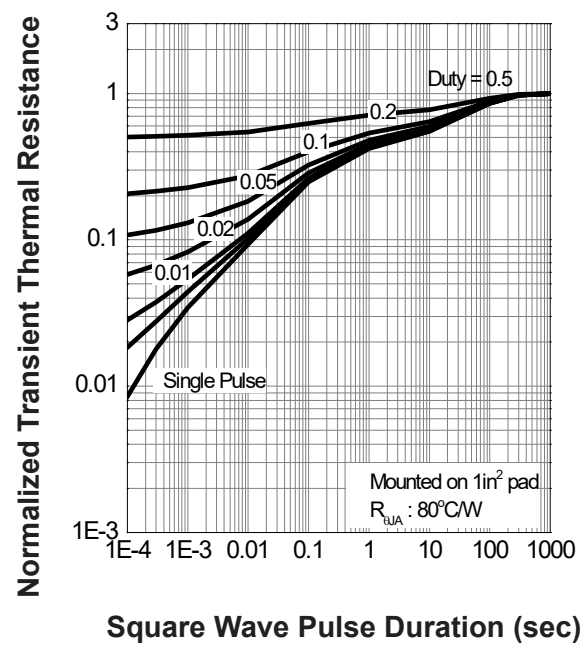
Drain Current



Safe Operation Area

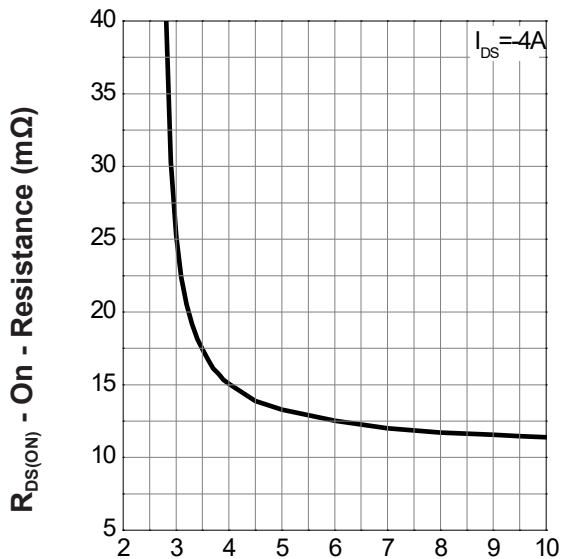


Thermal Transient Impedance



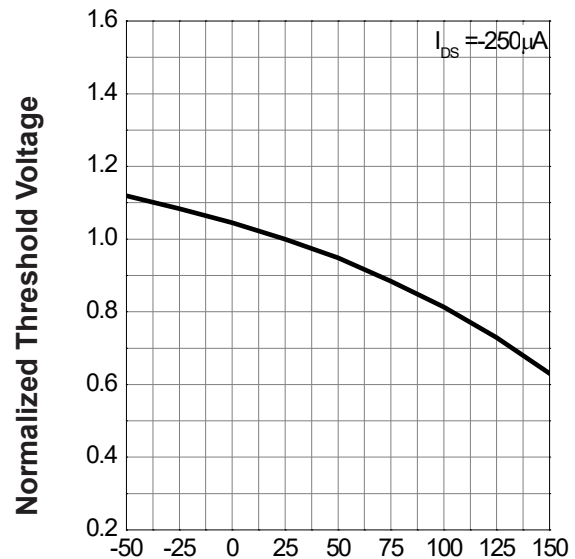
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance



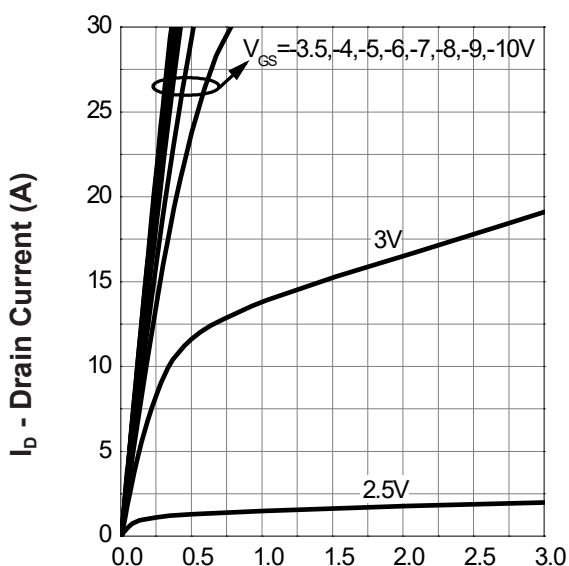
$-V_{GS}$ - Gate - Source Voltage (V)

Gate Threshold Voltage



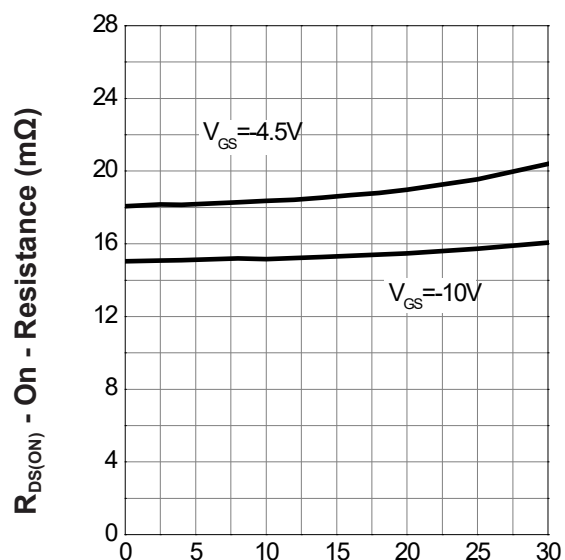
$-T_j$ - Junction Temperature ($^{\circ}C$)

Output Characteristics



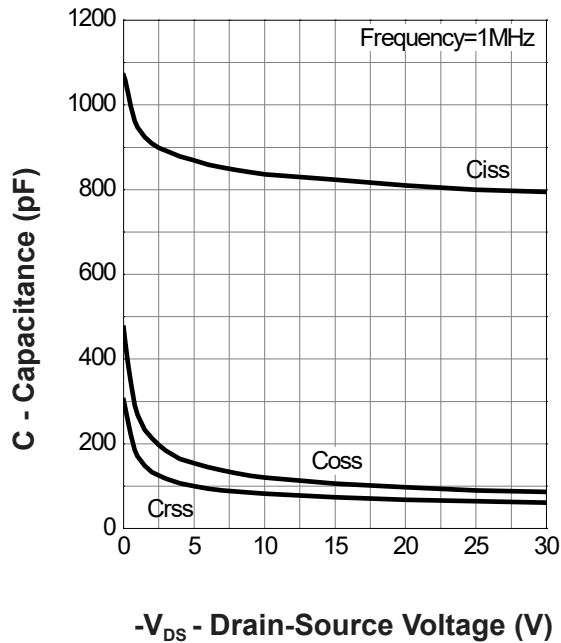
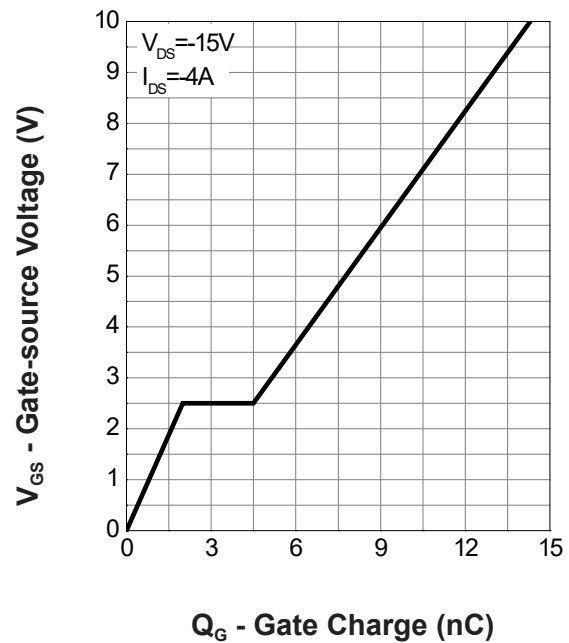
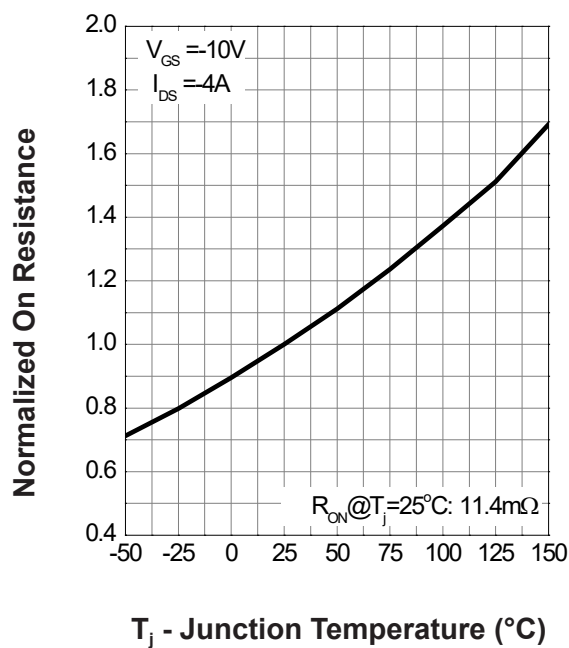
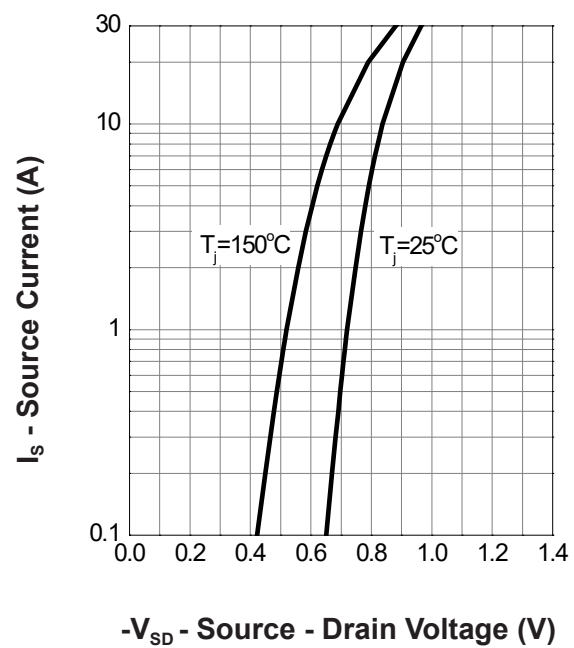
$-V_{DS}$ - Drain - Source Voltage (V)

Drain-Source On Resistance

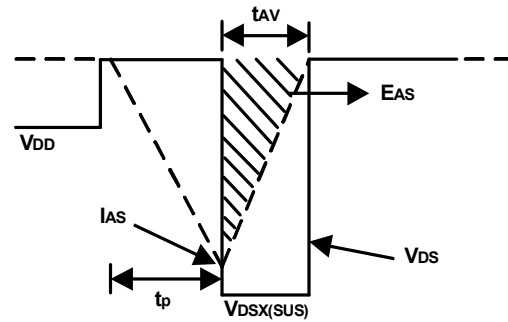
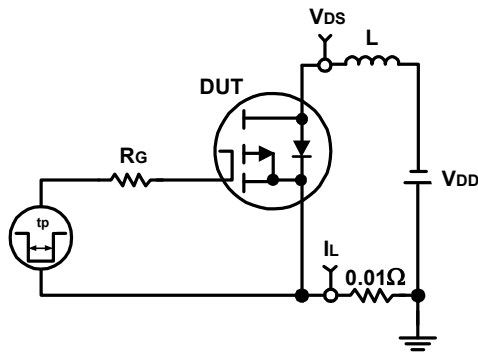


$-I_D$ - Drain Current (A)

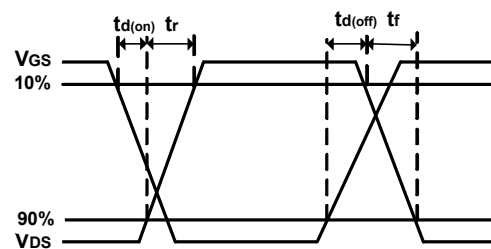
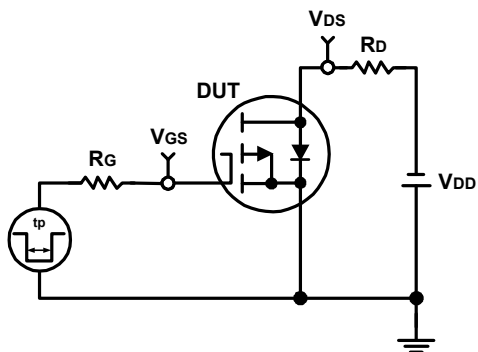
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

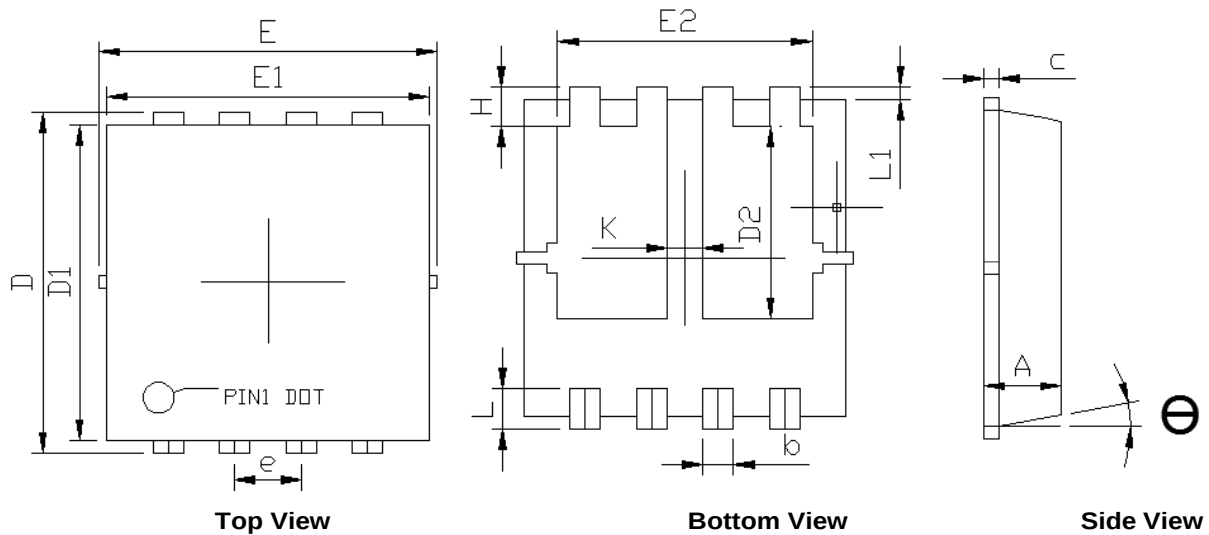


Switching Time Test Circuit and Waveforms



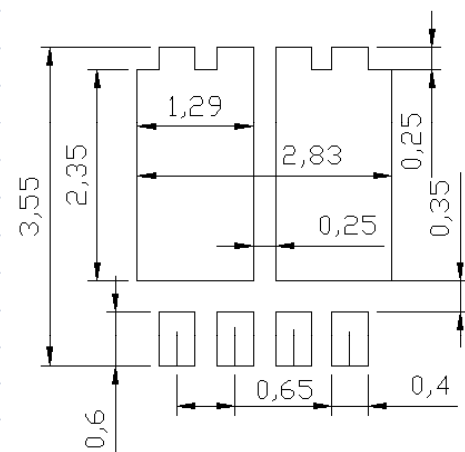
Package Information

DFN3.3x3.3-8L_EP2_P



SYMBOLS	DFN3.3x3.3G-8_EP2_P			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	0.80	0.028	0.031
b	0.25	0.35	0.010	0.014
c	0.10	0.25	0.004	0.010
D	3.25	3.45	0.128	0.136
D1	3.00	3.20	0.118	0.126
D2	1.78	1.98	0.070	0.078
E	3.20	3.40	0.126	0.134
E1	3.00	3.20	0.118	0.126
E2	2.39	2.59	0.094	0.102
e	0.65BSC		0.026 BSC	
H	0.30	0.50	0.012	0.020
L	0.30	0.50	0.012	0.020
L1	0.13 REF		0.005 REF	
K	0.30	-	0.012	-
θ	-	12°	-	12°

RECOMMENDED LAND PATTERN



UNIT: mm