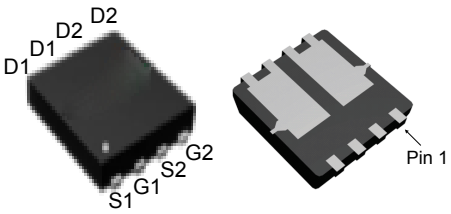
Features

- 40V/9A
  $R_{DS(ON)}$=25mΩ(typ.)@V_{GS}=10V
  $R_{DS(ON)}$=35mΩ(typ.)@V_{GS}=4.5V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

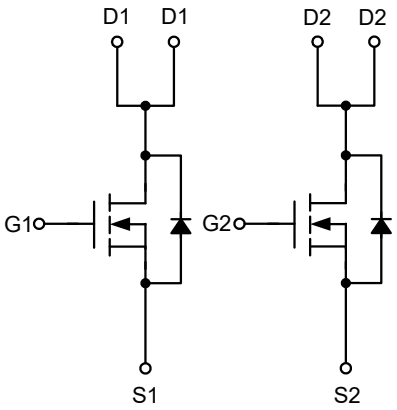
Applications

- Battery Protection.
- Load Switching.
- Bridge Topologies.

Pin Description



DFN3.3x3.3G-8_EP2



N-Channel MOSFET

Absolute Maximum Ratings (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
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	9	A
I_D	Continuous Drain Current	T_C=25°C	9	A
		T_C=100°C	6.75	
I_{DM}[b]	Pulsed Drain Current	T_C=25°C	27	
P_D	Maximum Power Dissipation	T_C=25°C	24	W
		T_C=100°C	9	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady state	5.3	°C/W
$R_{\theta JA}$[d]	Thermal Resistance-Junction to Ambient	t ≤ 10s	55	°C/W
		Steady state	93	
I_{AS}[e]	Avalanche Current, Single pulse	L=0.1mH	12	A
E_{AS}[e]	Avalanche Energy, Single pulse	L=0.1mH	7.2	mJ

Note a : Maximum continuous current is limited by bonding wire.
Note b : Pulse width limited by maximum junction temperature.
Note c : Surface mounted on 1in^2 pad area, t ≤ 10s.
Note d : Surface mounted on 1in^2 pad area, steady state t = 999s.
Note e : UIS tested and pulse width limited by maximum junction temperature (initial temperature T_j=25°C).

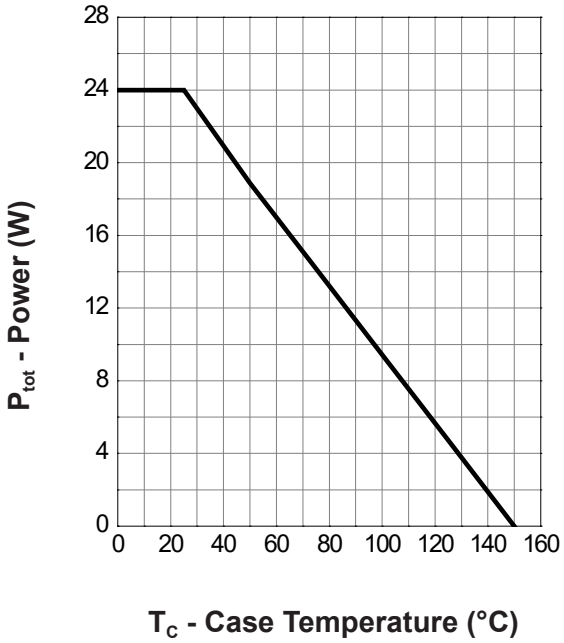
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	40	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=32V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1.5	1.8	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [f]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=10A	-	25	28	mΩ
		T_J=125°C	-	30	-	
		V_{GS}=4.5V, I_{DS}=6A	-	35	40	
Gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=6A	-	8.4	-	S
Diode Characteristics						
V_{SD} [f]	Diode Forward Voltage	I_{SD}=4A, V_{GS}=0V	-	0.8	1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=10A, dI_{SD}/dt=100A/μs	-	12	-	ns
t_a	Charge Time		-	7	-	
t_b	Discharge Time		-	5	-	
Q_{rr}	Reverse Recovery Charge		-	5	-	nC
Dynamic Characteristics [g]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	1.8	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Frequency=1.0MHz	-	633	823	pF
C_{oss}	Output Capacitance		-	60	-	
C_{rss}	Reverse Transfer Capacitance		-	43	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, R_L=20Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	10	18	ns
t_r	Turn-on Rise Time		-	9	17	
$t_{d(OFF)}$	Turn-off Delay Time		-	22	40	
t_f	Turn-off Fall Time		-	4	8	
Gate Charge Characteristics [g]						
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=10V, I_{DS}=10A	-	11.4	17	nC
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=4.5V, I_{DS}=10A	-	5.6	8	
Q_{gth}	Threshold Gate Charge		-	1	-	
Q_{gs}	Gate-Source Charge		-	1.8	-	
Q_{gd}	Gate-Drain Charge		-	2	-	

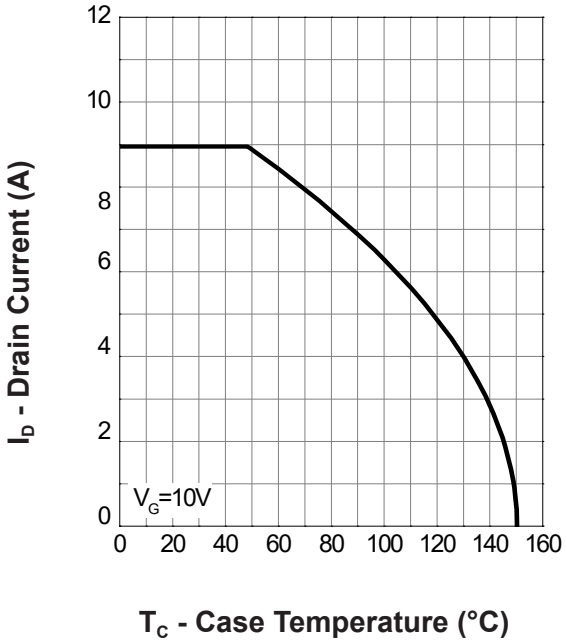
Note f：Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note g：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

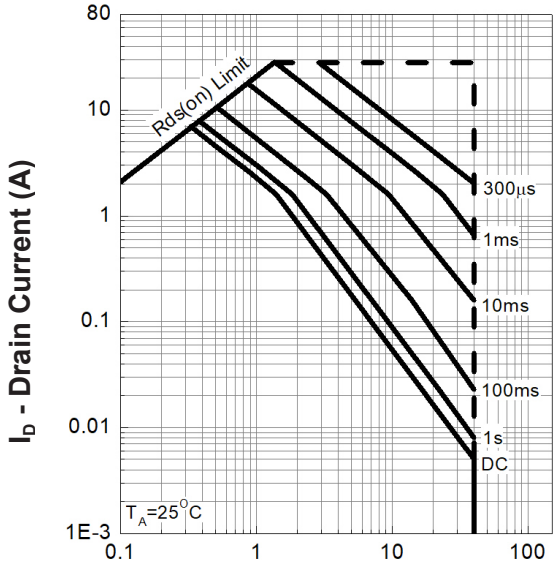
Power Dissipation



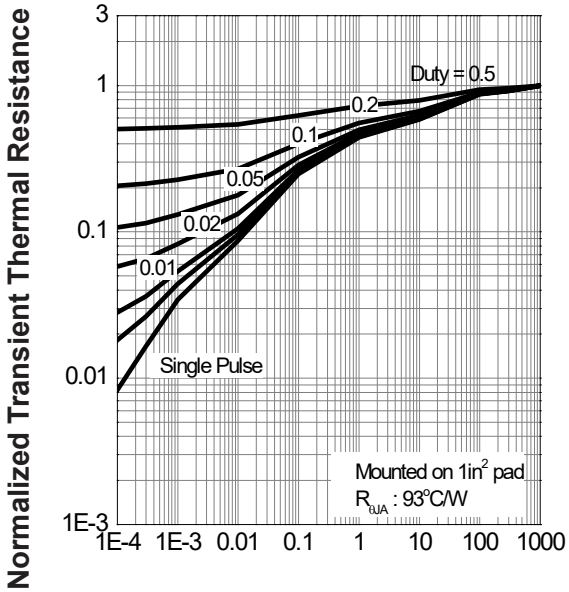
Drain Current



Safe Operation Area

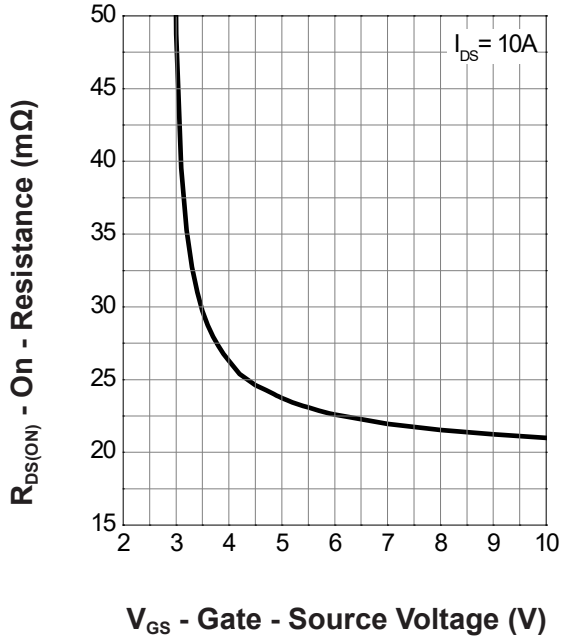


Thermal Transient Impedance

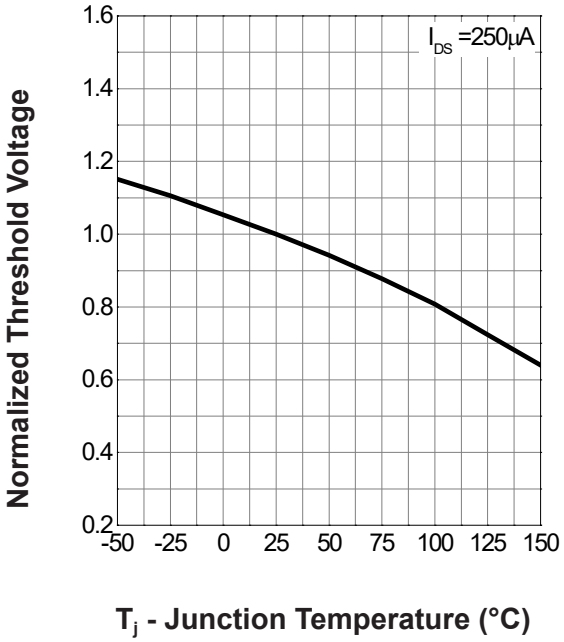


Typical Operating Characteristics(Cont.)

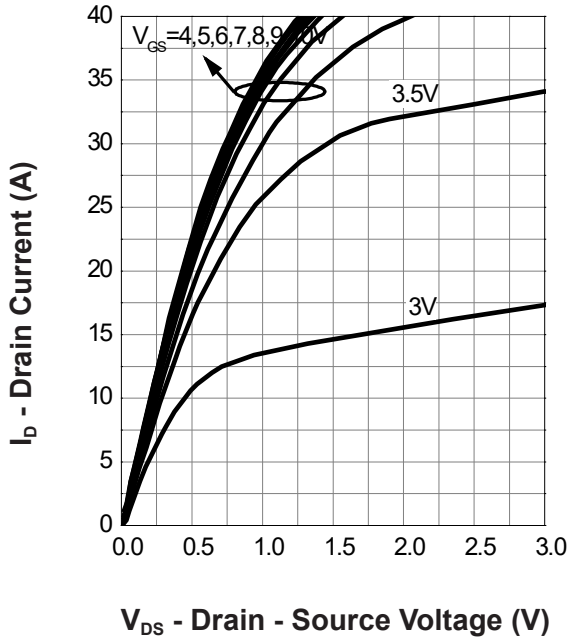
Gate-Source On Resistance



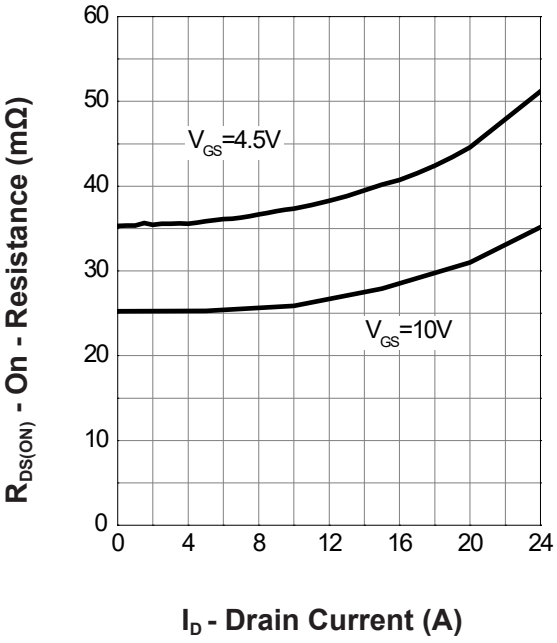
Gate Threshold Voltage



Output Characteristics

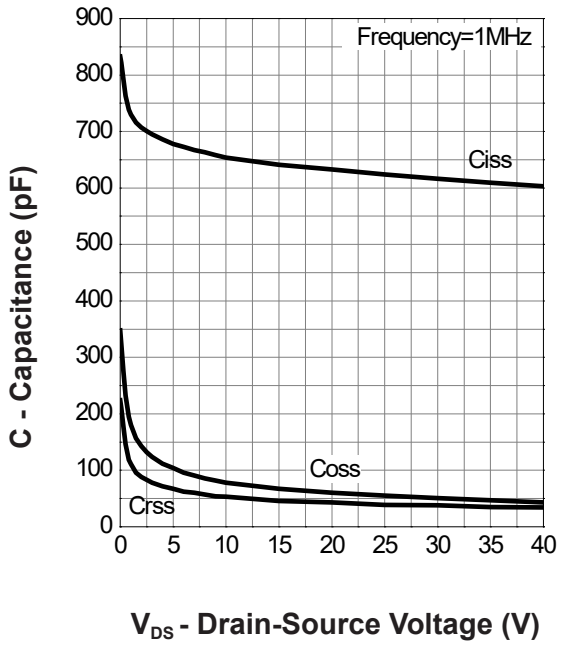


Drain-Source On Resistance

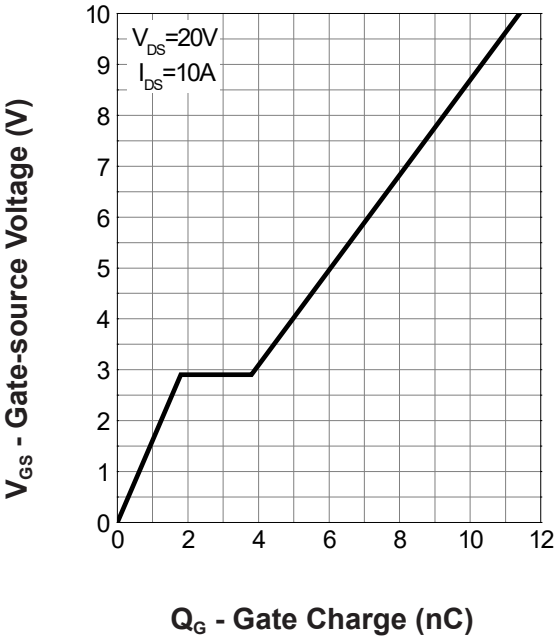


Typical Operating Characteristics(Cont.)

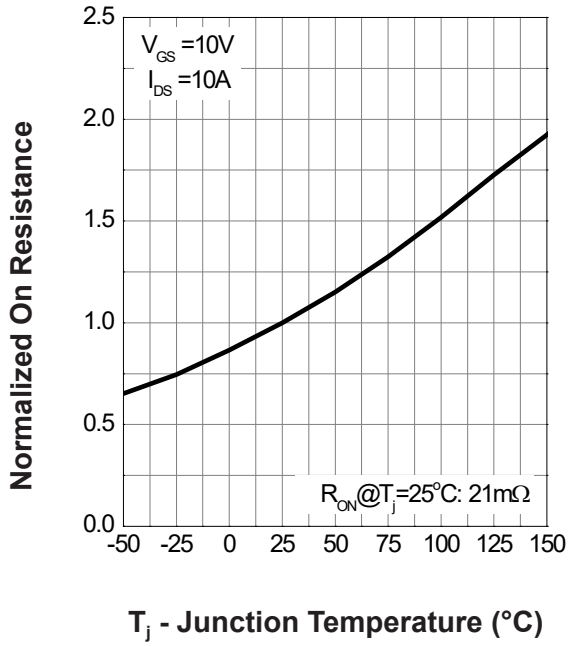
Capacitance



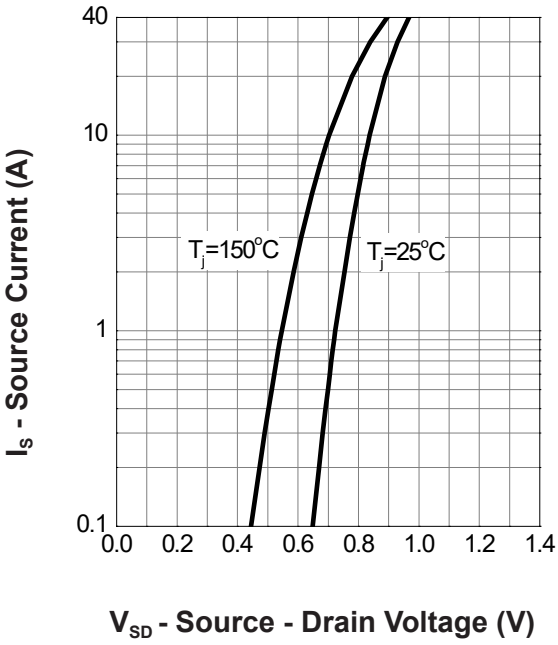
Gate Charge



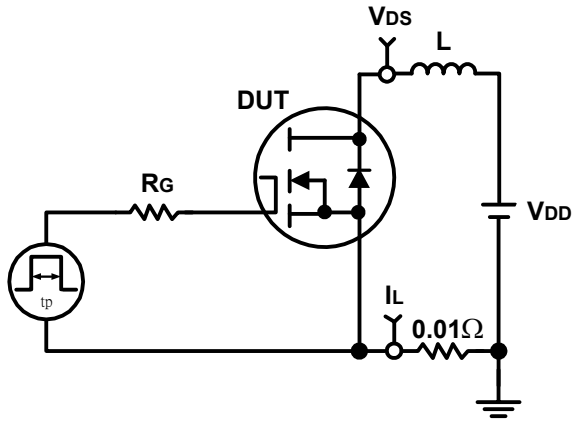
Drain-Source On Resistance

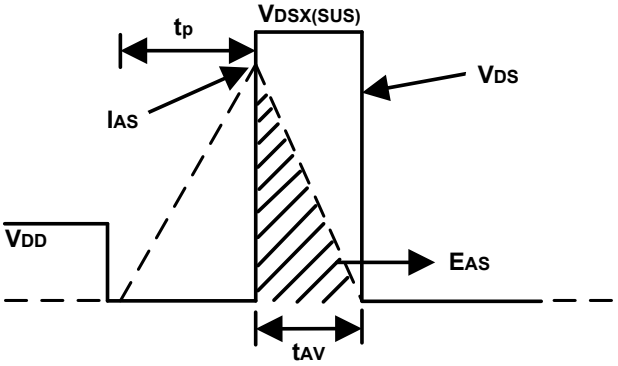


Source-Drain Diode Forward

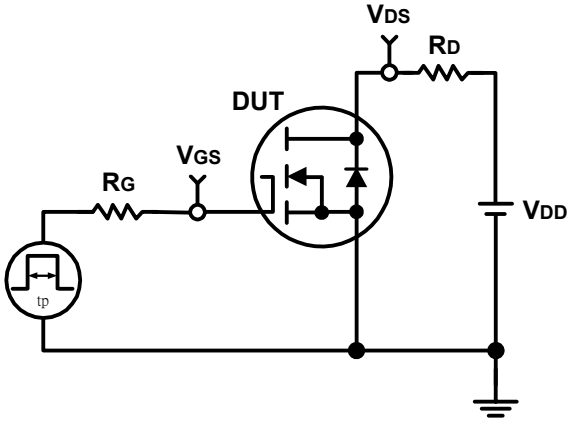


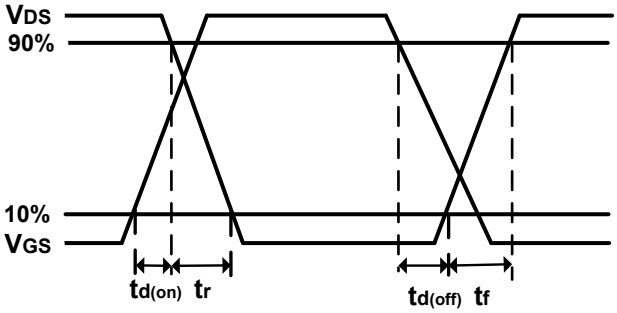
Avalanche Test Circuit and Waveforms





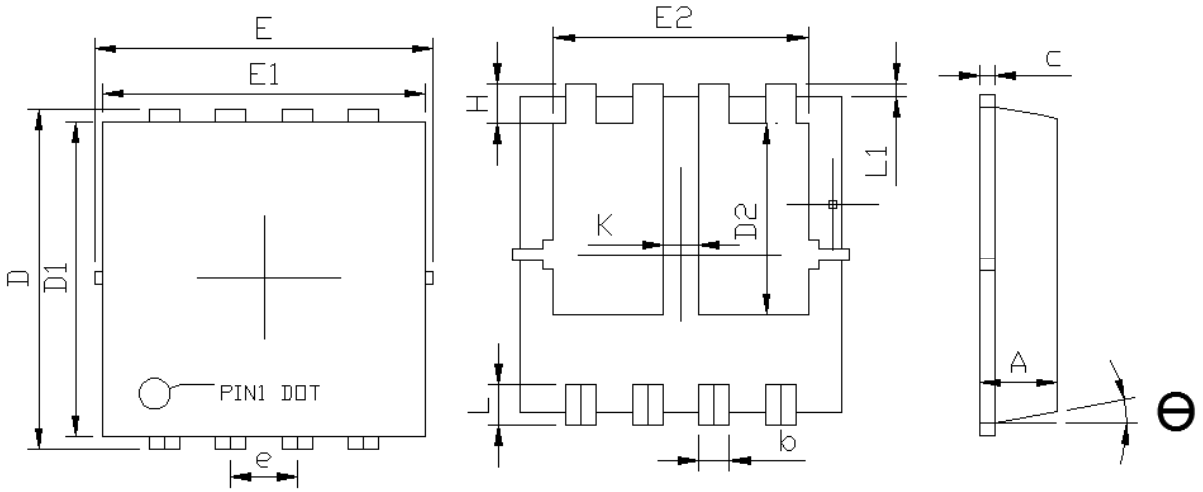
Switching Time Test Circuit and Waveforms





Package Information

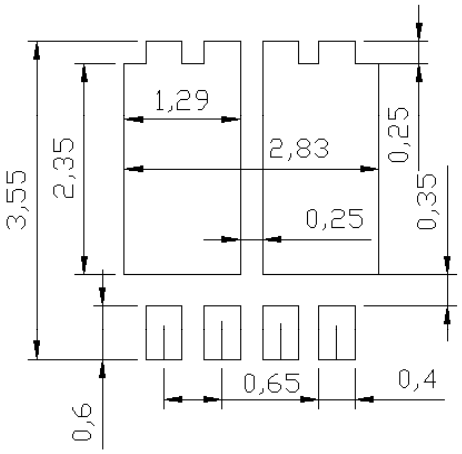
DFN3.3x3.3-8L_EP2_P



Top View | Bottom View | Side View

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