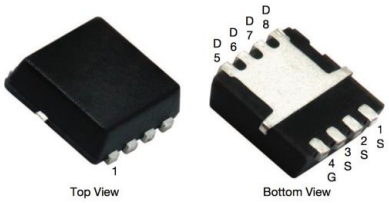
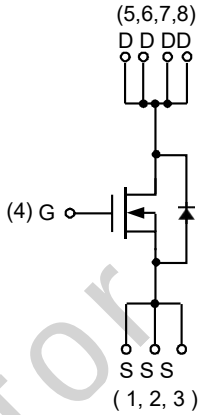
Features

- 30V/23A,
  $R_{DS(ON)}$ = 16mΩ(typ.) @ V_{GS} = 10V
  $R_{DS(ON)}$ = 21mΩ(typ.) @ V_{GS} = 4.5V
- Provide Excellent Q_{gd} x $R_{DS(ON)}$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



PDFN3*3-8L



N-Channel MOSFET

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	
I_D [a]	Continuous Drain Current (V_{GS}=10V)	T_A=25°C	7	A
		T_A=70°C	5.6	
I_{DM} [a]	Pulsed Drain Current (V_{GS}=10V)		28	
I_D [c]	Continuous Drain Current (V_{GS}=10V)	T_C=25°C	23	
		T_C=70°C	19	
I_S [a]	Diode Continuous Forward Current		1.5	
I_{AS} [b]	Avalanche Current, Single pulse	L=0.1mH	13	
		L=0.5mH	7	
E_{AS} [b]	Avalanche Energy, Single pulse	L=0.1mH	8.45	mJ
		L=0.5mH	12.25	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
P_D [a]	Maximum Power Dissipation	T_A=25°C	1.56	W
		T_A=70°C	1	
P_D [c]	Maximum Power Dissipation	T_C=25°C	17.8	
		T_C=70°C	11.4	
$R_{\theta JA}$ [a]	Thermal Resistance-Junction to Ambient	t ≤ 10s	50	°C/W
		Steady State	80	
$R_{\theta JC}$ [c]	Thermal Resistance-Junction to Case	Steady State	7	

Note a：Surface Mounted on 1in² pad area, t ≤ 10sec.
Note b：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_j=25°C).
Note c：The power dissipation P_D is based on $T_{J(MAX)}$ = 150°C, and it is useful for reducing junction-to-case thermal resistance ($R_{\theta JC}$) when additional heat sink is used.

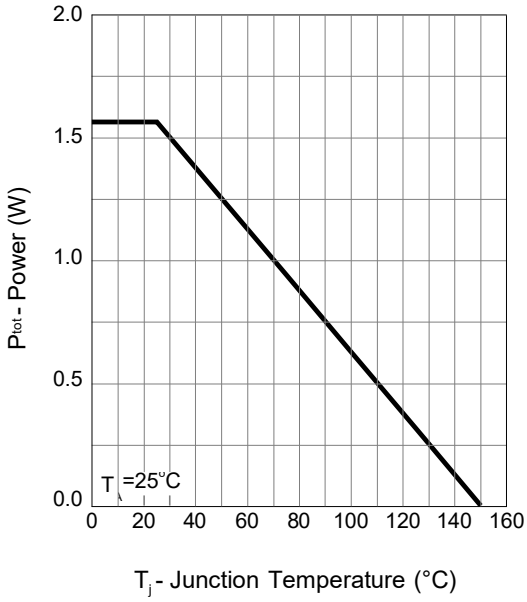
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	30	-	-	V
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	1.8	2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [d]	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=8A	-	16	21	mΩ
		T_J=125°C	-	25.5	-	
		V_{GS}=4.5V, I_{DS}=5A	-	21	26	
Diode Characteristics						
V_{SD} [d]	Diode Forward Voltage	I_{SD}=1A, V_{GS}=0V	-	0.75	1.1	V
t_{rr} [e]	Reverse Recovery Time	I_{SD}=8A, dI_{SD}/dt=100A/μs	-	12	-	ns
t_a	Charge Time		-	6.2	-	
t_b	Discharge Time		-	5.8	-	
Q_{rr} [e]	Reverse Recovery Charge		-	3.7	-	nC
Dynamic Characteristics [e]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	1	1.5	3	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	300	415	550	pF
C_{oss}	Output Capacitance		50	70	100	
C_{rss}	Reverse Transfer Capacitance		30	40	60	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=15V, R_L=15Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	-	5.5	9	ns
t_r	Turn-on Rise Time		-	9	18	
$t_{d(OFF)}$	Turn-off Delay Time		-	14	25	
t_f	Turn-off Fall Time		-	3.6	7	
Gate Charge Characteristics [e]						
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=4.5V, I_{DS}=8A	-	3.8	5.5	nC
Q_g	Total Gate Charge	V_{DS}=15V, V_{GS}=10V, I_{DS}=8A	-	8	13	
Q_{gth}	Threshold Gate Charge		-	0.4	0.7	
Q_{gs}	Gate-Source Charge		-	1.1	1.8	
Q_{gd}	Gate-Drain Charge		-	1.6	2.1	

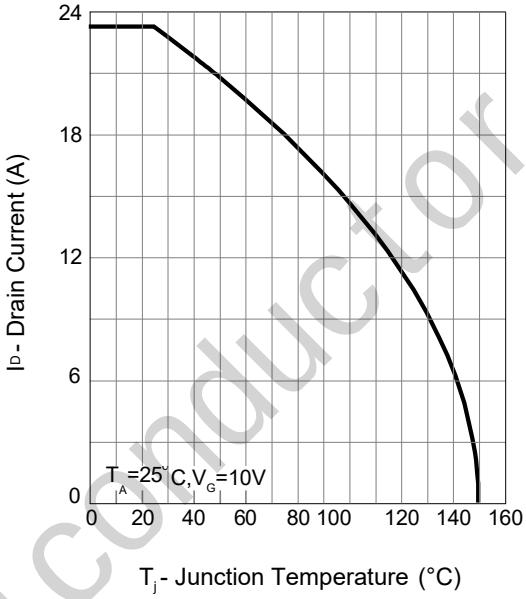
Note d：Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%.
Note e：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

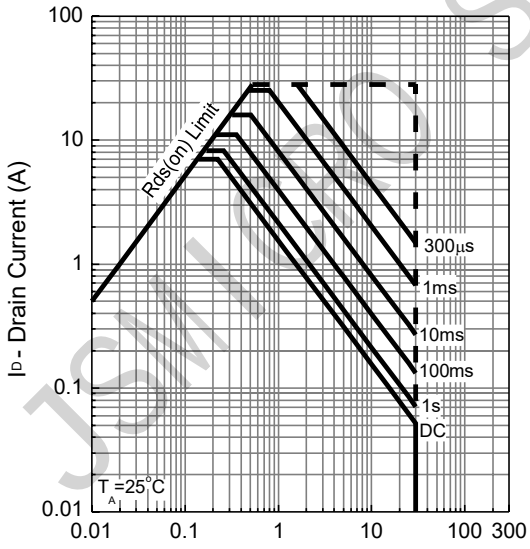
Power Dissipation



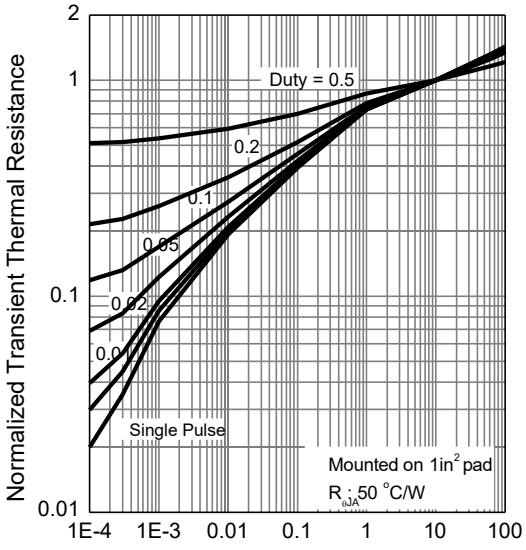
Drain Current



Safe Operation Area

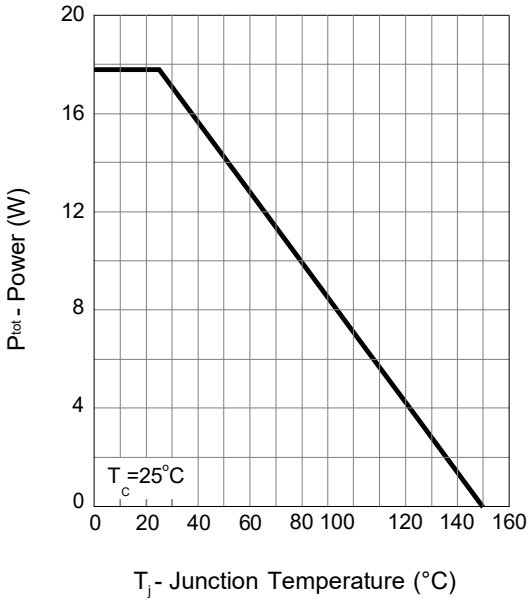


Thermal Transient Impedance

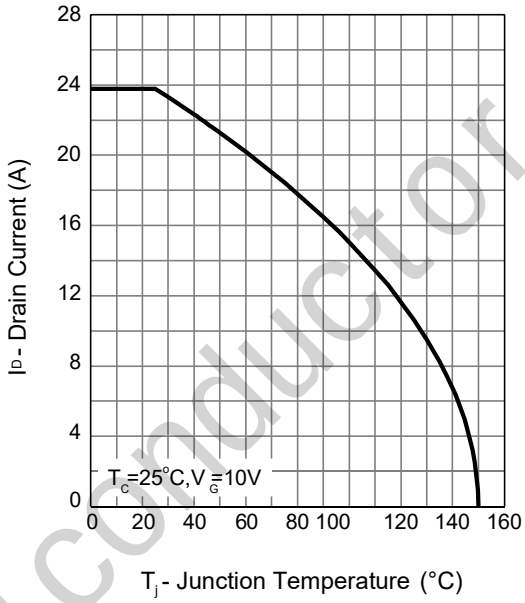


Typical Operating Characteristics (Cont.)

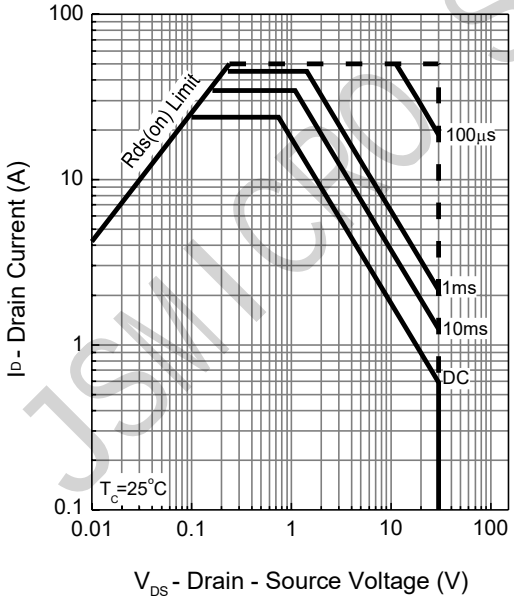
Power Dissipation



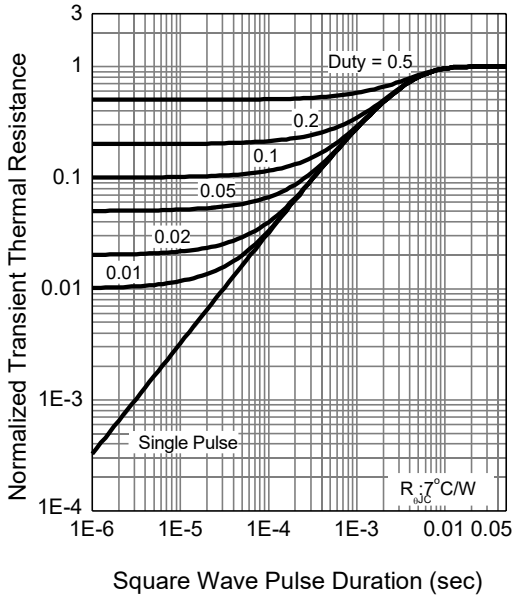
Drain Current



Safe Operation Area

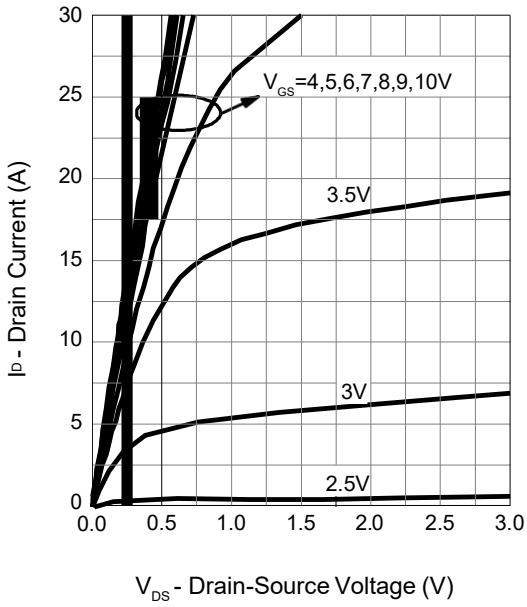


Thermal Transient Impedance

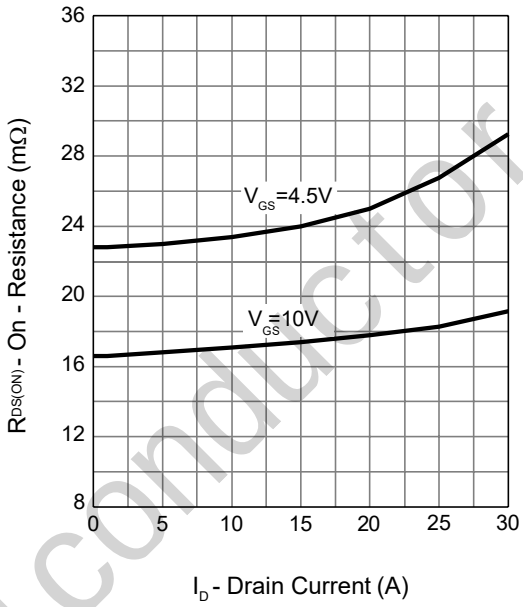


Typical Operating Characteristics (Cont.)

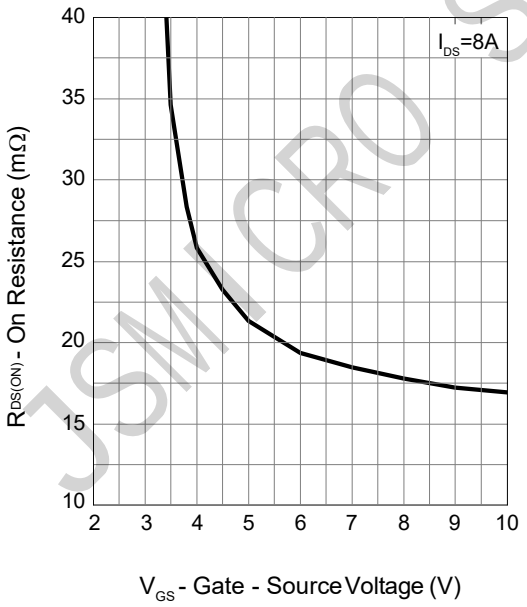
Output Characteristics



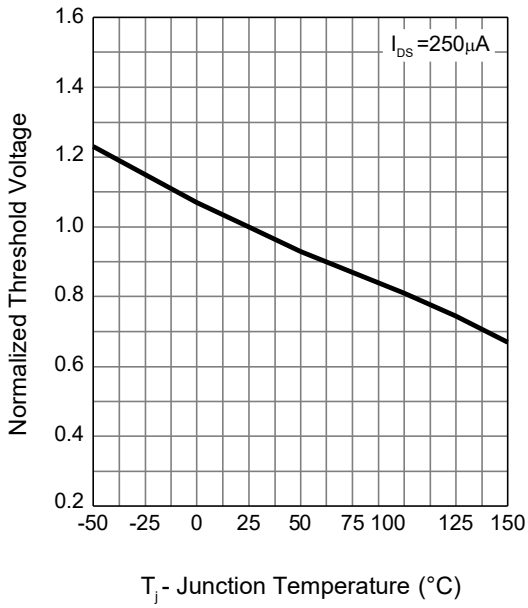
Drain-Source On Resistance



Gate-Source On Resistance

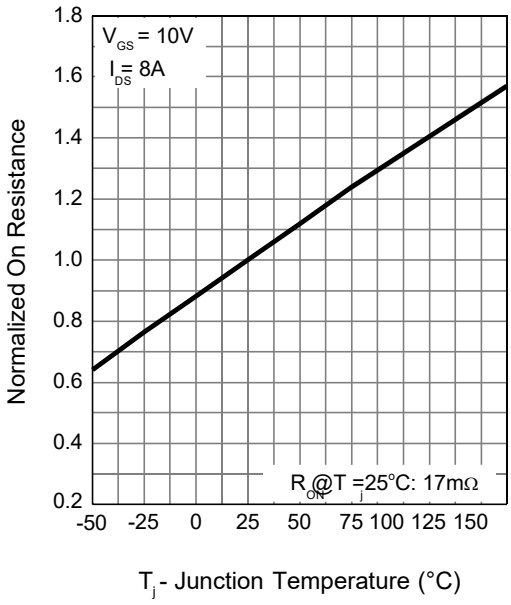


Gate Threshold Voltage

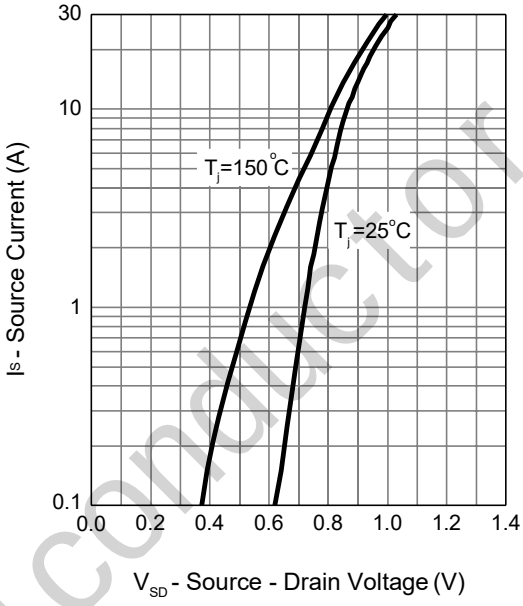


Typical Operating Characteristics (Cont.)

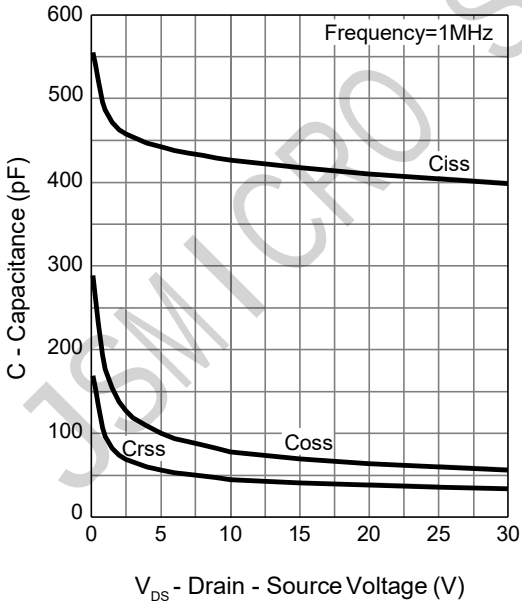
Drain-Source On Resistance



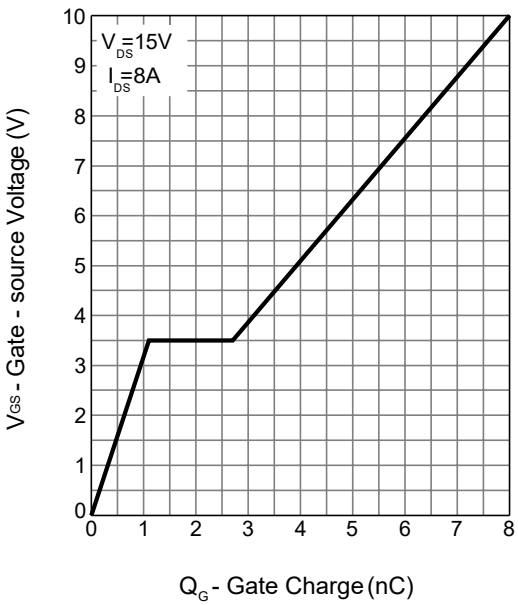
Source-Drain Diode Forward



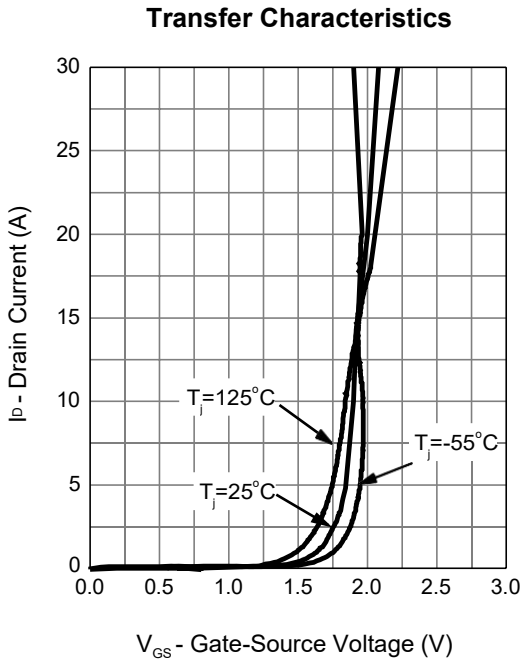
Capacitance



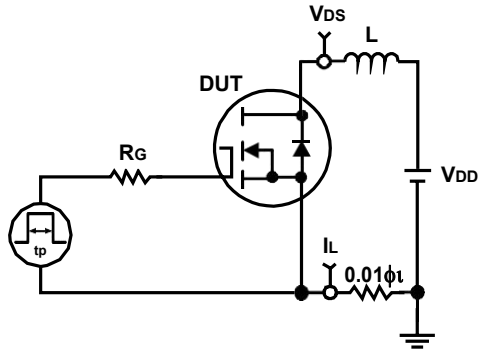
Gate Charge

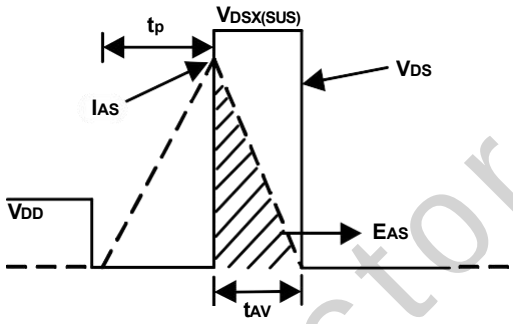


Typical Operating Characteristics (Cont.)

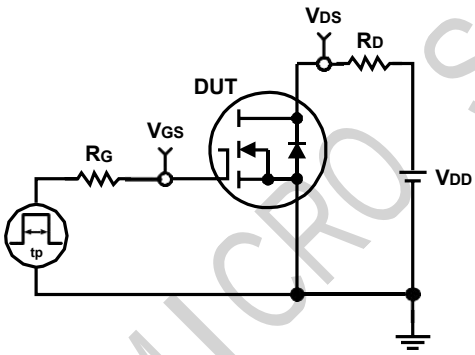


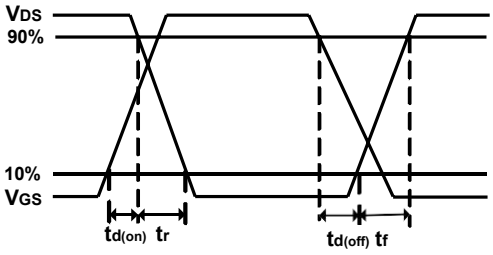
Avalanche Test Circuit and Waveforms



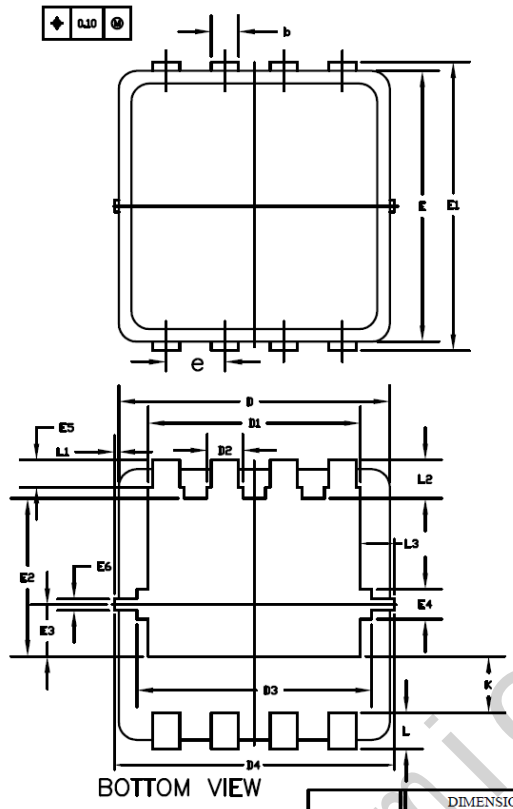


Switching Time Test Circuit and Waveforms

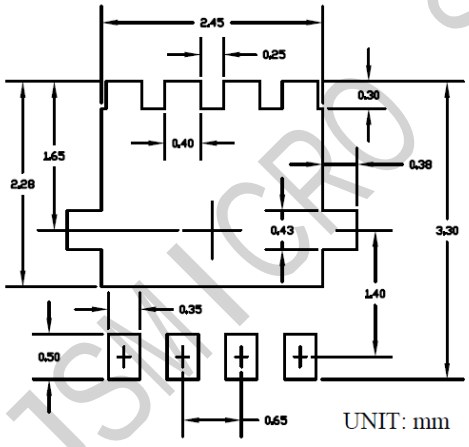




- **Package Information**



RECOMMENDED LAND PATTERN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.70	0.80	0.90	0.028	0.031	0.035
A1	0.00	0.025	0.05	0.000	0.001	0.002
b	0.24	0.30	0.35	0.009	0.012	0.014
c	0.10	0.15	0.25	0.004	0.006	0.010
D	2.90	3.00	3.10	0.114	0.118	0.122
D1	2.25	2.35	2.45	0.089	0.093	0.097
D2	0.30	0.40	0.50	0.012	0.016	0.020
D3	2.50	2.60	2.70	0.098	0.102	0.106
D4	3.00	3.10	3.20	0.118	0.122	0.126
E	2.90	3.00	3.10	0.114	0.118	0.122
E1	3.10	3.20	3.30	0.122	0.126	0.130
E2	1.65	1.75	1.85	0.065	0.069	0.073
E3	0.48	0.58	0.68	0.019	0.023	0.027
E4	0.23	0.33	0.43	0.009	0.013	0.017
E5	0.20	0.30	0.40	0.008	0.012	0.016
E6	0.075	0.125	0.175	0.003	0.005	0.007
e	0.60	0.65	0.70	0.024	0.026	0.028
K	0.52	0.62	0.72	0.020	0.024	0.028
L	0.30	0.40	0.50	0.012	0.016	0.020
L1	0	0.05	0.10	0	0.002	0.004
L2	0.33	0.43	0.53	0.013	0.017	0.021
L3	0.275	0.375	0.475	0.011	0.015	0.019
θ1	0°	10°	12°	0°	10°	12°

NOTE
1. PACKAGE DIMENSION IS EXCLUSIVE OF MOLD GATE BURR
2. PACKAGE DIMENSION IS EXCLUSIVE OF MOLD FLASH AND CUTTING BURR
3. CONTROLLING DIMENSION IS MILLIMETER.
   CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.