-60V P-Channel Enhancement Mode MOSFET

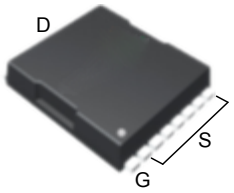
Features

- -60V/-180A
  $R_{DS(ON)}$=5mΩ(typ.)@V_{GS}=-10V
  $R_{DS(ON)}$=6mΩ(typ.)@V_{GS}=-4.5V
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- SMPS Synchronous Rectification
- Load Switch
- DC-DC Conversion
- Or-ing

Pin Description



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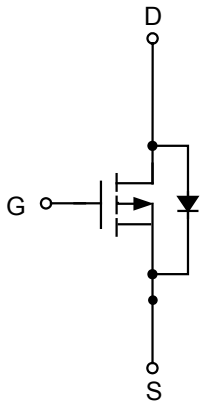


P-Channel MOSFET

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
XPX180P06LL	XPX180P06LL	TOLL	-	-	2000

Absolute Maximum Ratings (T_A=25°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		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	T_C=25°C	-180	A
I_D	Continuous Drain Current	T_C=25°C	-180	A
		T_C=100°C	-100	
I_{DM} [a]	Pulsed Drain Current	T_C=25°C	-400	
P_D	Maximum Power Dissipation	T_C=25°C	395	W
		T_C=100°C	205	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	0.4	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	Steady State	50	°C/W
I_{AS} [b]	Avalanche Current, Single pulse	L=0.5mH	-55	A
E_{AS} [b]	Avalanche Energy, Single pulse	L=0.5mH	756	mJ

Note a：Pulse width limited by max. junction temperature.
Note b：UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature Tj=25°C).

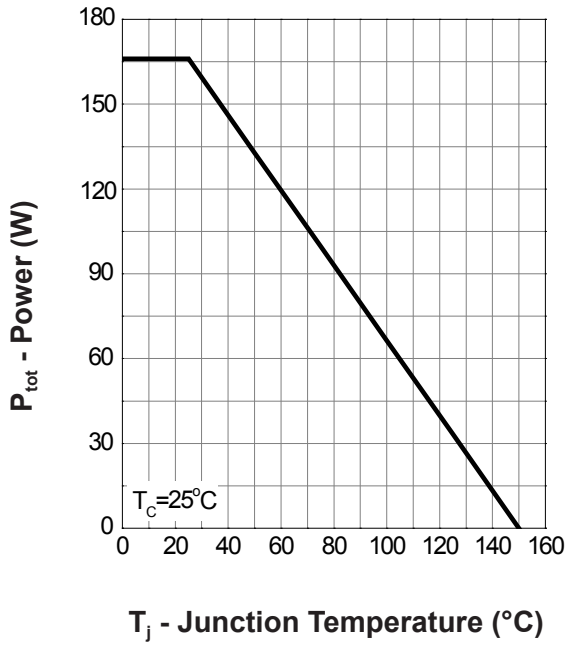
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-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	-1.0	-1.7	-2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [c]	Drain-Source On-state Resistance	V_{GS}=-10V, I_{DS}=-30A	-	5	6	mΩ
		V_{GS}=-4.5V, I_{DS}=-20A	-	6	8	mΩ
Diode Characteristics						
V_{SD} [c]	Diode Forward Voltage	I_{SD}=-1A, V_{GS}=0V	-	-0.7	-1.1	V
t_{rr}	Reverse Recovery Time	I_{SD}=-20A, dI_{SD}/ dt=100A/μs	-	29	-	ns
Q_{rr}	Reverse Recovery Charge		-	18	-	nC
Dynamic Characteristics [d]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,f=1MHz	-	3.2	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-20V, Frequency=1.0MHz	-	2780	3614	pF
C_{oss}	Output Capacitance		-	426	-	
C_{rss}	Reverse Transfer Capacitance		-	331	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-20V, R_L=20Ω, I_{DS}=-1A, V_{GEN}=-10V, R_G=6Ω	-	13	24	ns
t_r	Turn-on Rise Time		-	11	20	
$t_{d(OFF)}$	Turn-off Delay Time		-	94	170	
t_f	Turn-off Fall Time		-	48	87	
Gate Charge Characteristics [d]						
Q_g	Total Gate Charge	V_{DS}=-20V, V_{GS}=-4.5V, I_{DS}=-30A	-	32	-	nC
Q_g	Total Gate Charge	V_{DS}=-20V, V_{GS}=-10V, I_{DS}=-30A	-	63	88	
Q_{gs}	Gate-Source Charge		-	10.2	-	
Q_{gd}	Gate-Drain Charge		-	17.3	-	

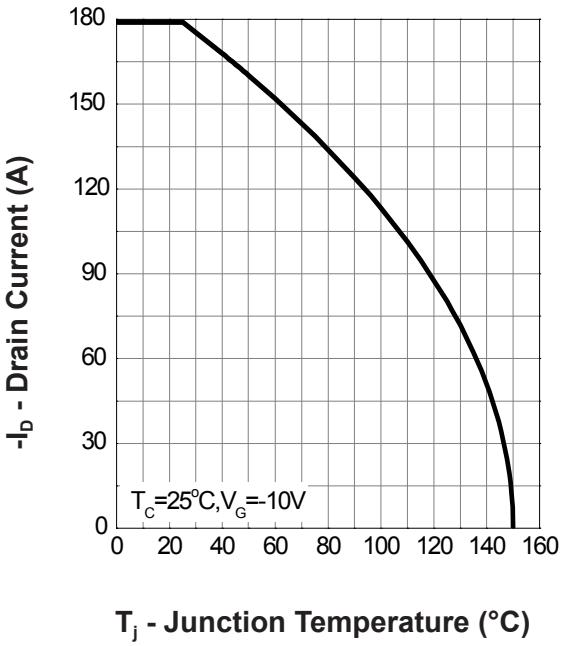
Note c：Pulse test ; pulse width≤300μs, duty cycle≤2%.
Note d：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

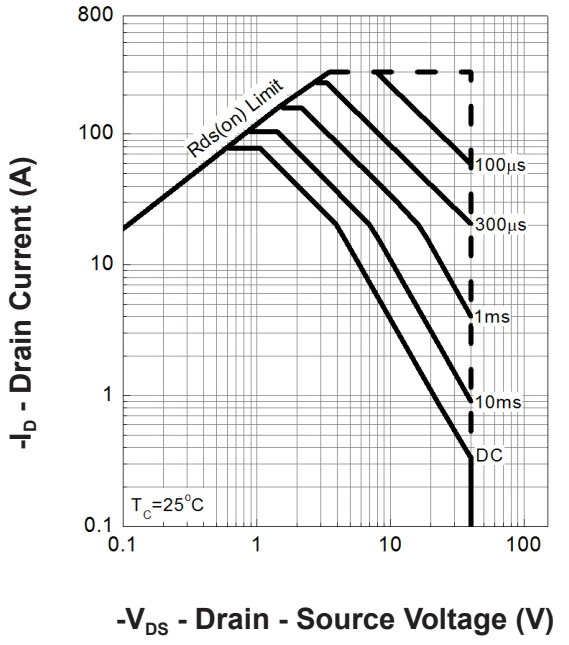
Power Dissipation



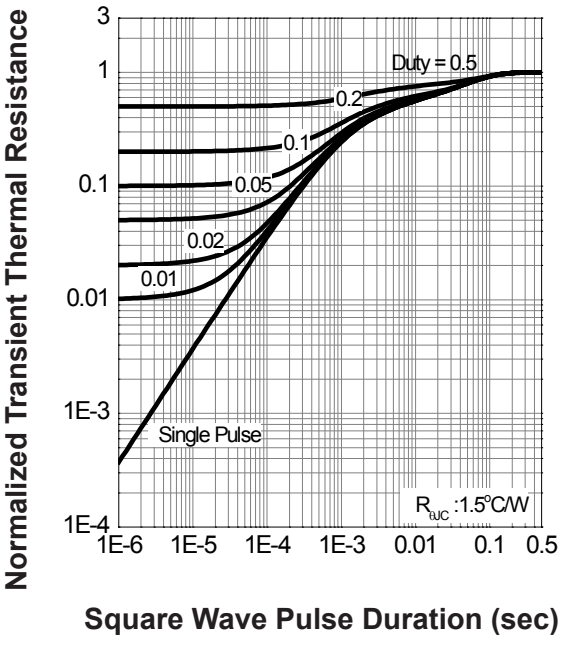
Drain Current



Safe Operation Area

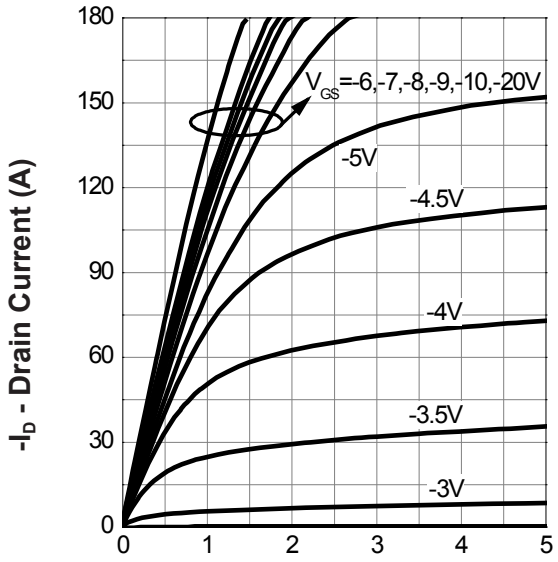


Thermal Transient Impedance

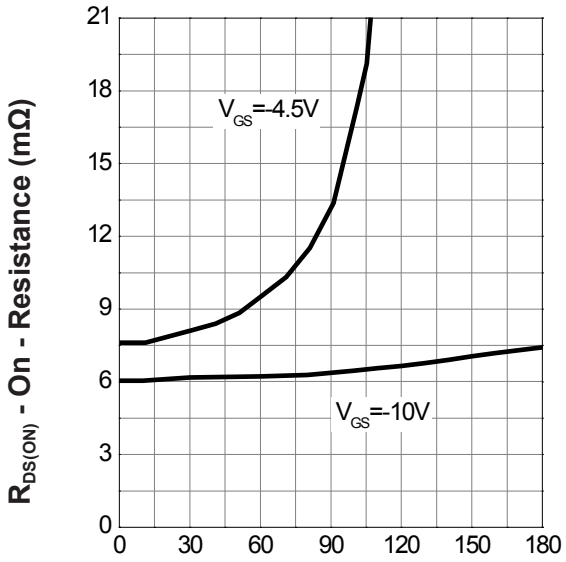


Typical Operating Characteristics(Cont.)

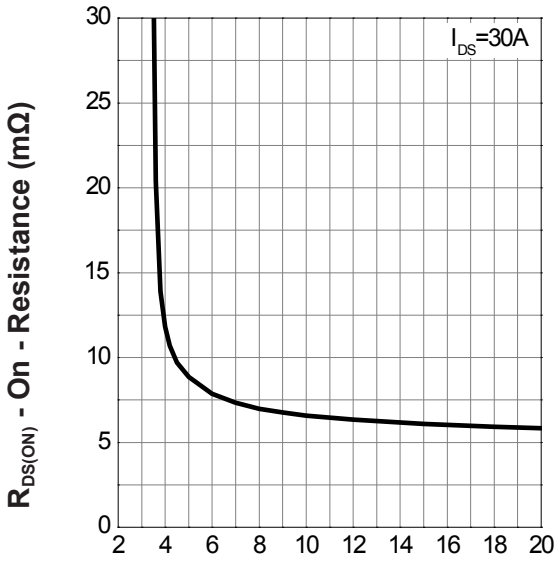
Output Characteristics



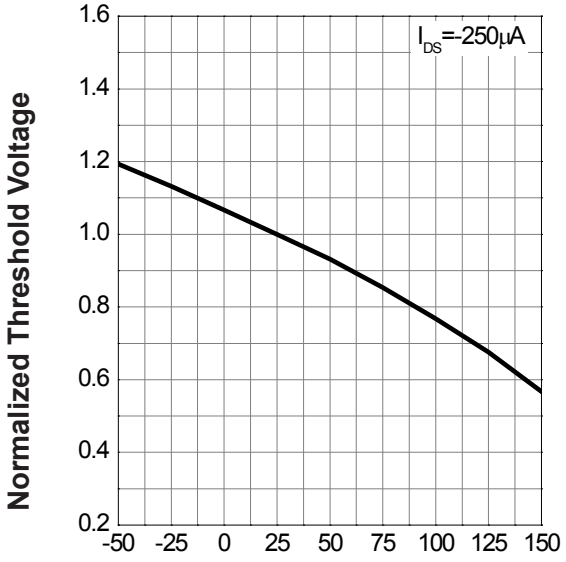
Drain-Source On Resistance



Gate-Source On Resistance

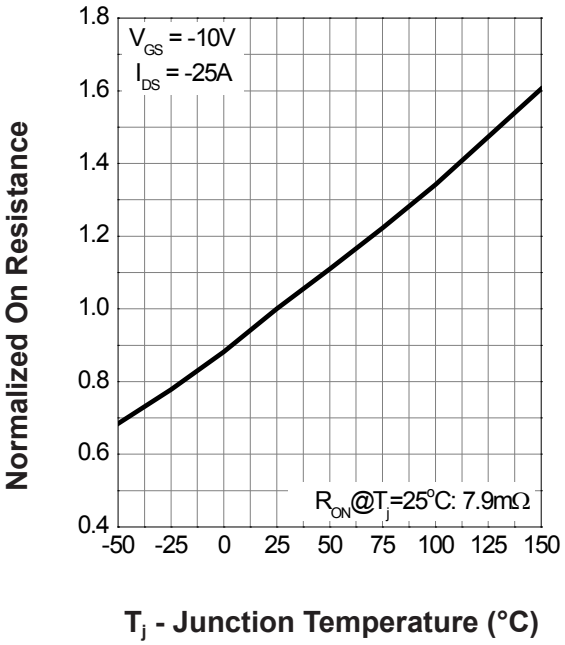


Gate Threshold Voltage

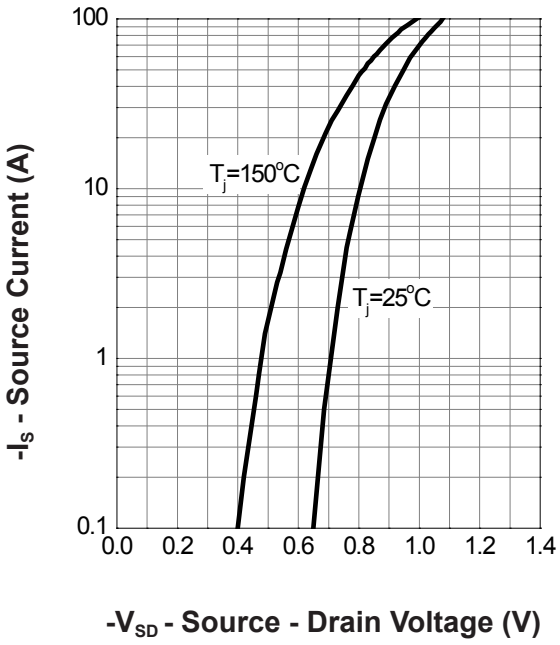


Typical Operating Characteristics(Cont.)

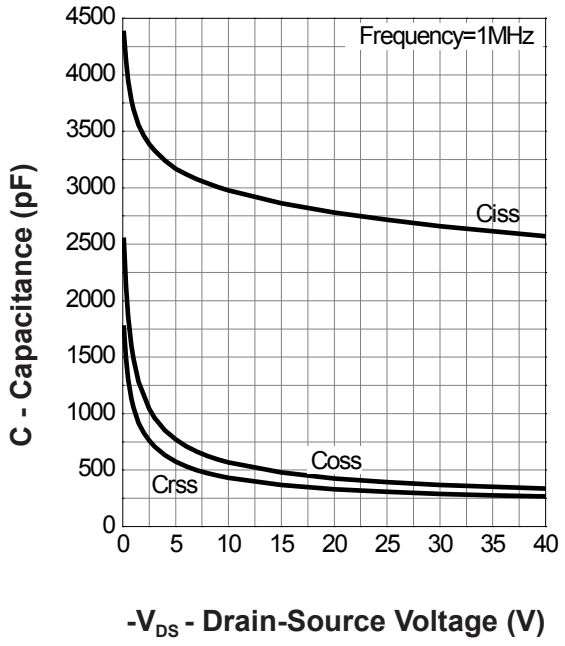
Drain-Source On Resistance



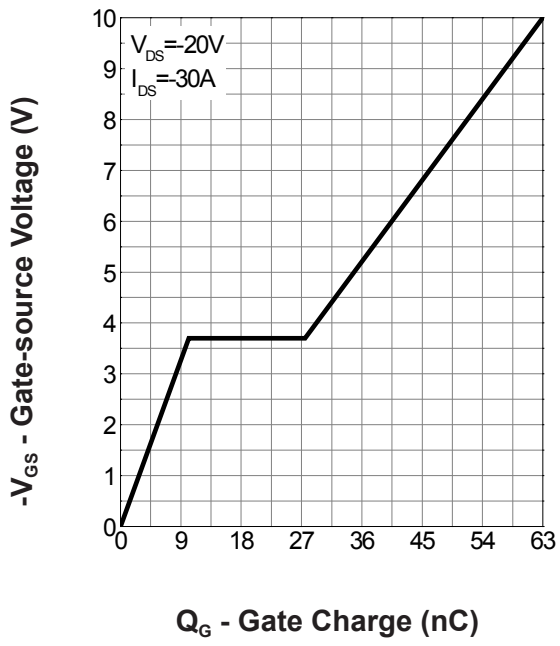
Source-Drain Diode Forward



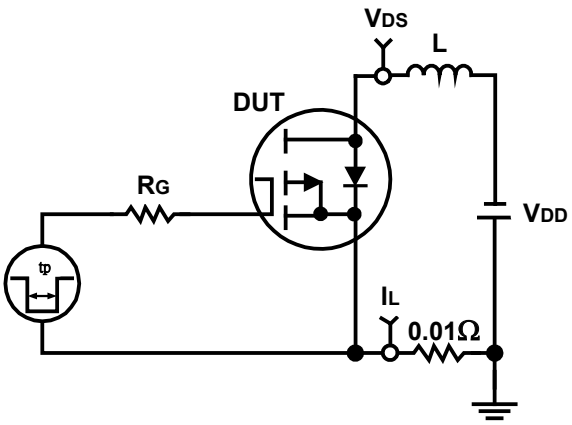
Capacitance

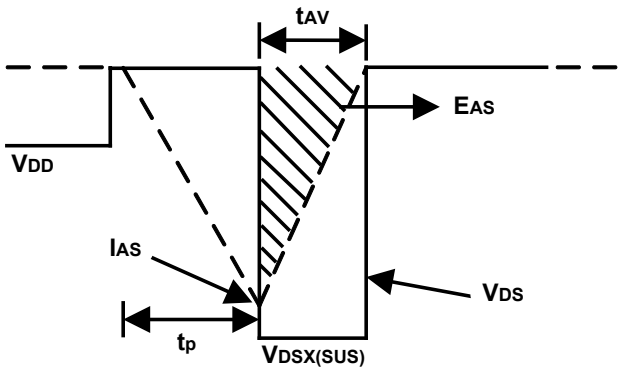


Gate Charge

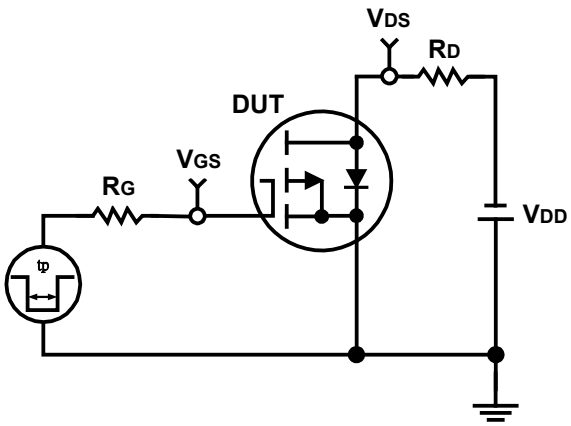


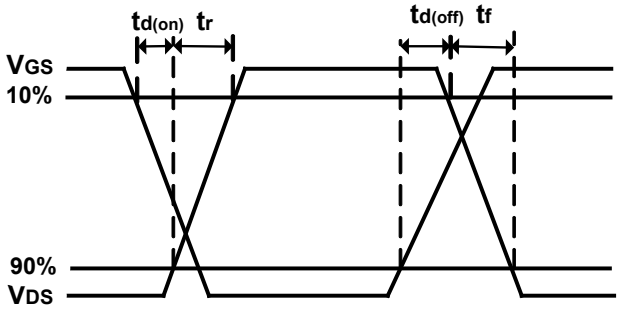
Avalanche Test Circuit and Waveforms





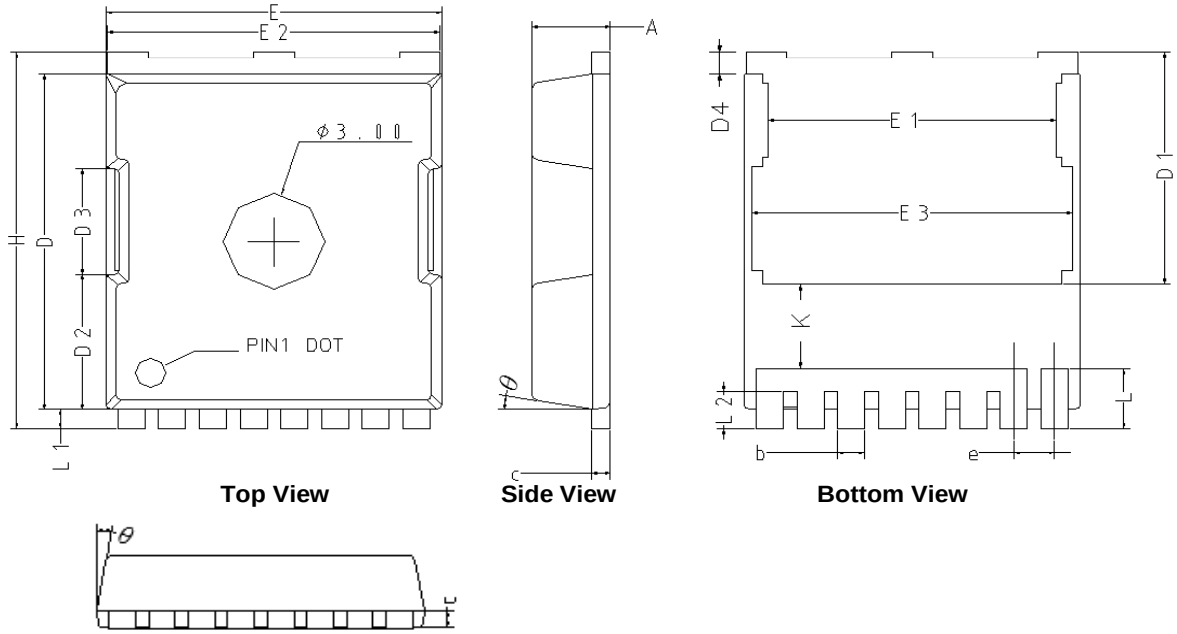
Switching Time Test Circuit and Waveforms





Package Information

TOLL

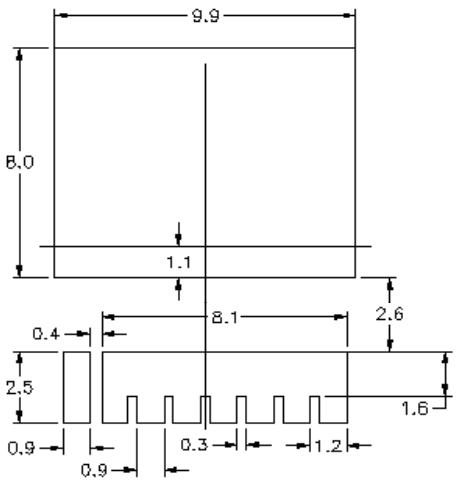


Top View Side View Bottom View

Side View

SYMBOLS	TO-LL			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.20	2.40	0.087	0.094
b	0.70	0.90	0.028	0.035
c	0.40	0.60	0.016	0.024
D	10.23	10.63	0.403	0.419
D1	7.05	7.45	0.278	0.293
D2	3.98	4.38	0.157	0.172
D3	3.10	3.50	0.122	0.138
D4	0.50	0.90	0.020	0.035
E	9.70	10.10	0.382	0.398
E1	8.30	8.70	0.327	0.343
E2	9.60	10.00	0.378	0.394
E3	9.26	9.66	0.365	0.380
H	11.53	11.93	0.454	0.470
e	1.2 BSC		0.0472 BSC	
K	2.43	2.83	0.096	0.111
L	1.65	2.05	0.065	0.081
L1	0.40	0.80	0.016	0.031
L2	0.95	1.35	0.037	0.053
θ	6°	10°	6°	10°

RECOMMENDED LAND PATTERN



UNIT: mm

Flow (wave) soldering (solder dipping)

Product	Peak Temperature	Dipping Time
Pb device	245℃±5℃	5sec±1sec
Pb-Free device	260℃+0/-5℃	5sec±1sec

This integrated circuit can be damaged by ESD UniverChip Corporation recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedure can cause damage. ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

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