



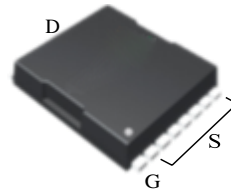
## Features

- 85V/200A  
 $R_{DS(ON)}=2.3m\Omega(\text{typ.})@V_{GS}=10V$
- 100% UIS +  $R_g$  Tested
- Reliable and Rugged
- Lead Free and Green Devices Available  
(RoHS Compliant)
- Moisture Sensitivity Level MSL1  
(per JEDEC J-STD-020D)

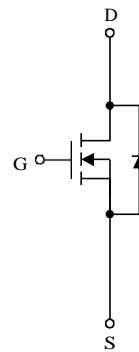
## Applications

- High Efficiency Synchronous Rectification in SMPS.
- Uninterruptible Power Supply.
- Hard Switched and High Frequency Circuits.

## Pin Description



TO-LL



N-Channel MOSFET



## Absolute Maximum Ratings (T<sub>A</sub>=25°C Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
<b>Common Ratings</b>				
V <sub>DSS</sub>	Drain-Source Voltage	85	V	
V <sub>GSS</sub>	Gate-Source Voltage	±20		
T <sub>J</sub>	Maximum Junction Temperature	175	°C	
T <sub>STG</sub>	Storage Temperature Range	-55 to 175		
I <sub>S</sub>	Diode Continuous Forward Current	T <sub>C</sub> =25°C	200	A
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> =25°C	200	
	Continuous Drain Current	T <sub>C</sub> =100°C	80	
I <sub>DM</sub> <sup>a</sup>	Pulsed Drain Current	T <sub>C</sub> =25°C	600	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>C</sub> =25°C	231	W
		T <sub>C</sub> =100°C	115	
R <sub>θJC</sub>	Thermal Resistance-Junction to Case	0.65	°C/W	
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> =25°C	19	A
		T <sub>A</sub> =70°C	16	
P <sub>D</sub>	Maximum Power Dissipation	T <sub>A</sub> =25°C	3	W
		T <sub>A</sub> =70°C	2.1	
R <sub>θJA</sub>	Thermal Resistance-Junction to Ambient	50	°C/W	
I <sub>AS</sub> <sup>b</sup>	Avalanche Current, Single pulse	L=0.5mH	47	A
E <sub>AS</sub> <sup>b</sup>	Avalanche Energy, Single pulse	L=0.5mH	552	mJ

Note a : Pulse width limited by maximum junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature (initial temperature T<sub>j</sub>=25 °C).



## Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>DS</sub> =250μA	85	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =68V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C	-	-	1	μA
			-	-	30	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	2	3	4	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
R <sub>DS(ON)</sub> <sup>c</sup>	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =80A	-	2.3	3.2	mΩ
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>c</sup>	Diode Forward Voltage	I <sub>SD</sub> =40A, V <sub>GS</sub> =0V	-	0.8	1.1	V
t <sub>r</sub> <sup>d</sup>	Reverse Recovery Time	I <sub>SD</sub> =80A, dI <sub>SD</sub> /dt=100A/μs	-	65	-	ns
Q <sub>r</sub> <sup>d</sup>	Reverse Recovery Charge		-	113	-	nC
<b>Dynamic Characteristics<sup>d</sup></b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	-	1	-	Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =50V, Frequency=1.0MHz	-	5500	7150	pF
C <sub>oss</sub>	Output Capacitance		-	873	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	117	-	
t <sub>d(ON)</sub>	Turn-on Delay Time	V <sub>DD</sub> =30V, R <sub>L</sub> =30Ω, I <sub>DS</sub> =1A, V <sub>GEN</sub> =10V, R <sub>G</sub> =6Ω	-	34	61	ns
t <sub>r</sub>	Turn-on Rise Time		-	15	28	
t <sub>d(OFF)</sub>	Turn-off Delay Time		-	81	145	
t <sub>f</sub>	Turn-off Fall Time		-	156	280	
<b>Gate Charge Characteristics<sup>d</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, V <sub>GS</sub> =10V, I <sub>DS</sub> =80A	-	82	115	nC
Q <sub>gs</sub>	Gate-Source Charge		-	30	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	16	-	

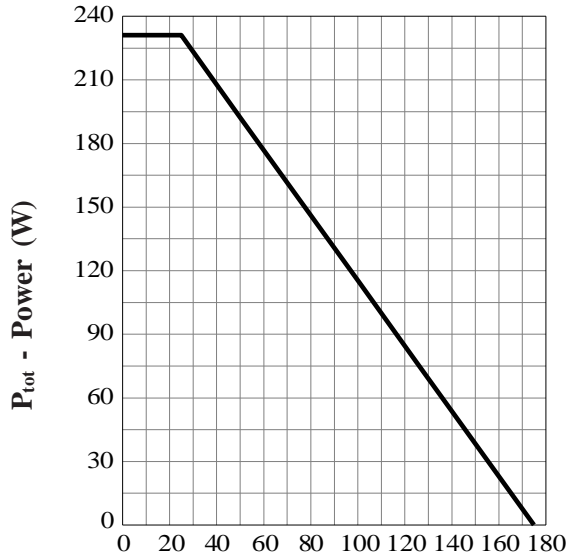
Note c : Pulse test ; pulse width≤300μs, duty cycle≤2%.

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



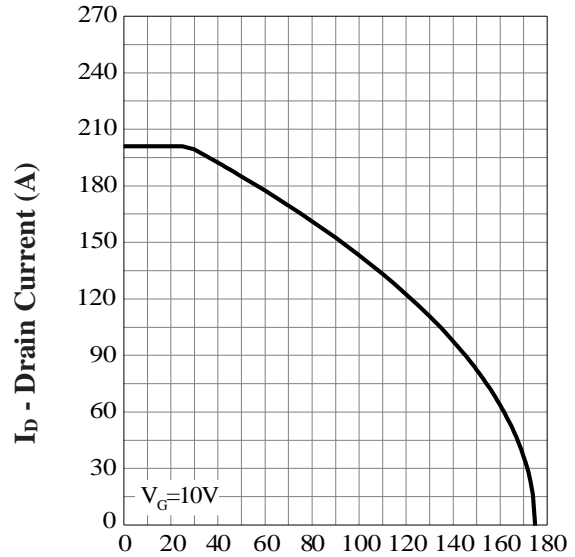
## Typical Operating Characteristics

### Power Dissipation



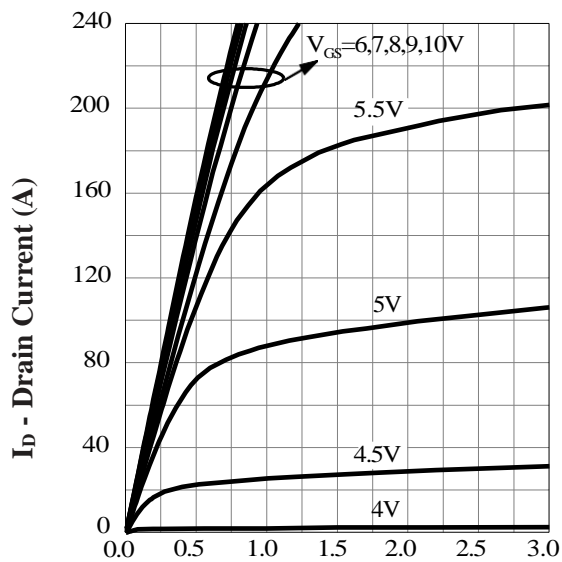
$T_C$  - Case Temperature (°C)

### Drain Current



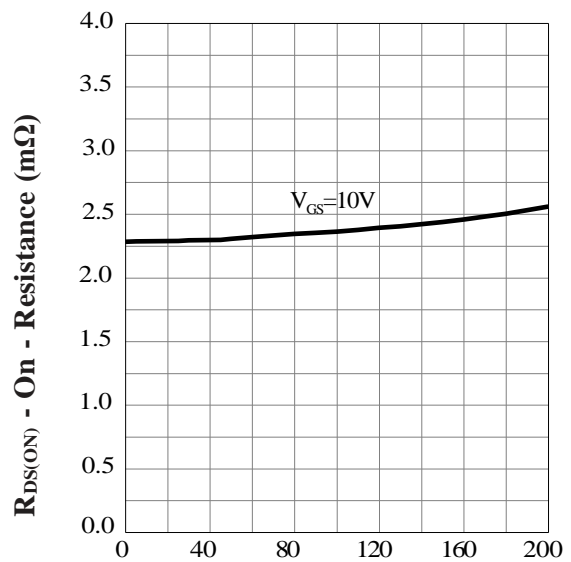
$T_C$  - Case Temperature (°C)

### Output Characteristics



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

### Drain-Source On Resistance

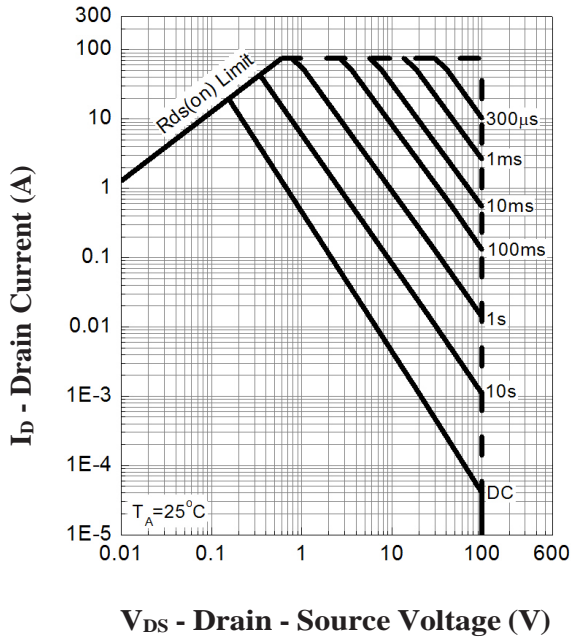


$I_D$  - Drain Current (A)

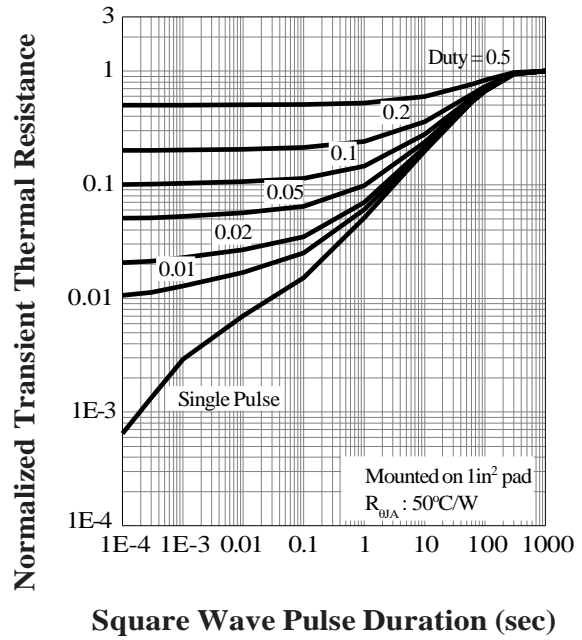


## Typical Operating Characteristics(Cont.)

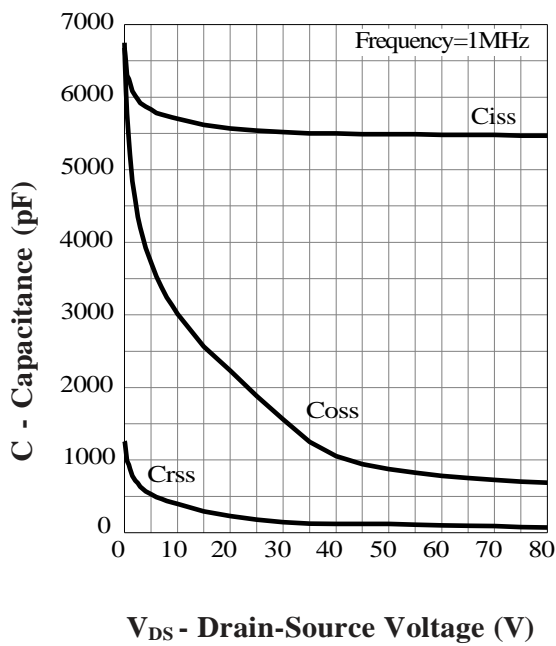
### Safe Operation Area



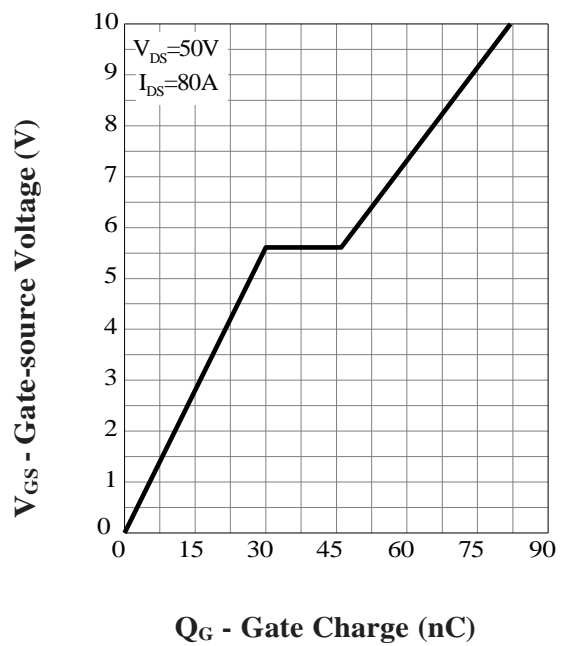
### Thermal Transient Impedance



### Capacitance



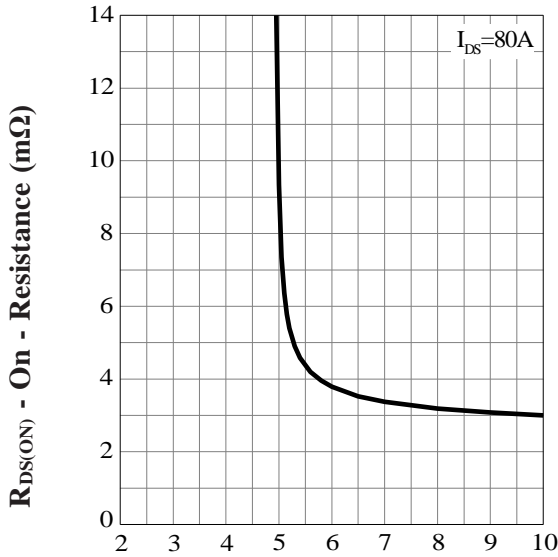
### Gate Charge





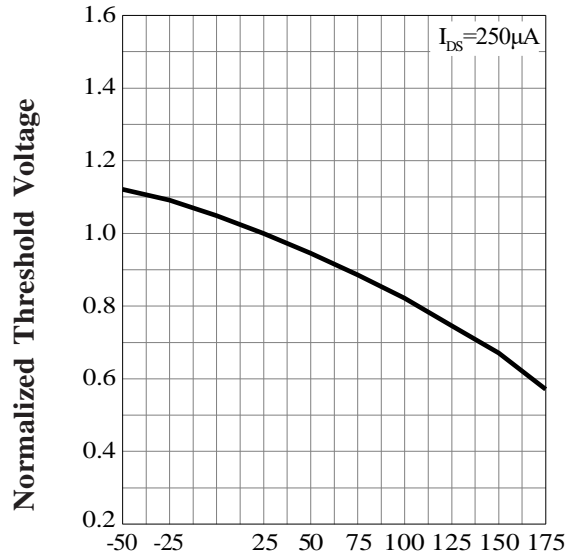
## Typical Operating Characteristics(Cont.)

### Gate-Source On Resistance



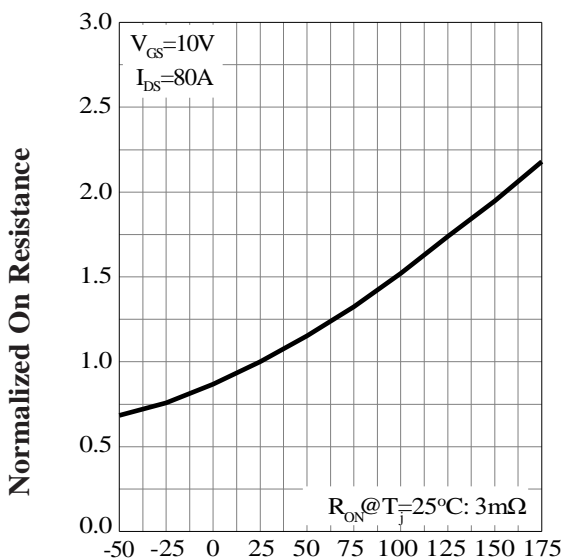
V<sub>GS</sub> - Gate - Source Voltage (V)

### Gate Threshold Voltage



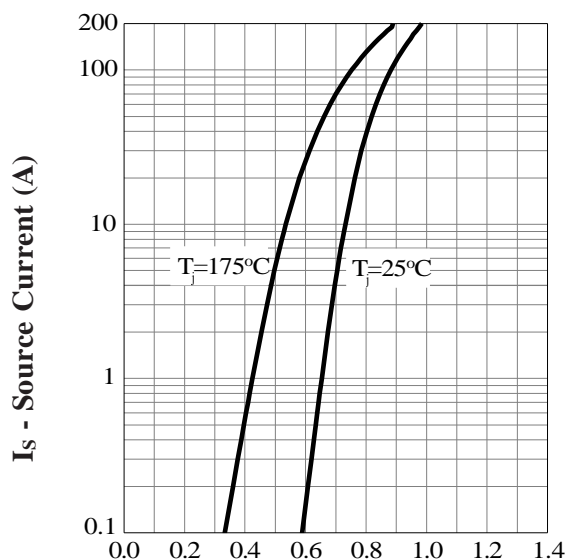
T<sub>j</sub> - Junction Temperature (°C)

### Drain-Source On Resistance



T<sub>j</sub> - Junction Temperature (°C)

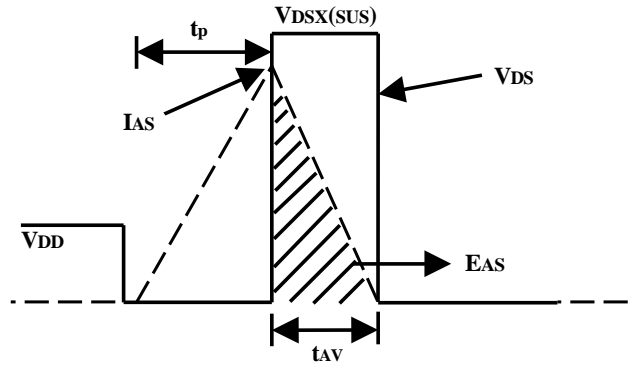
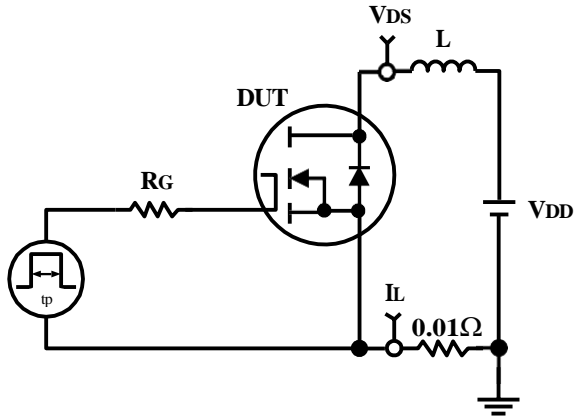
### Source-Drain Diode Forward



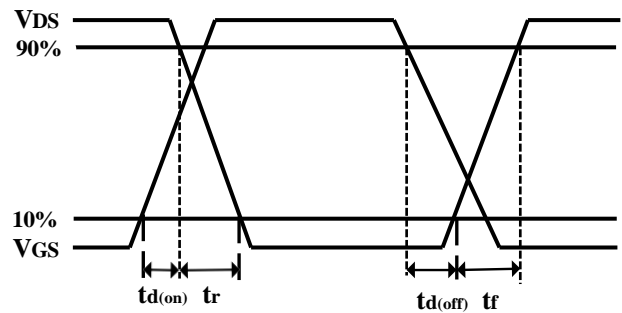
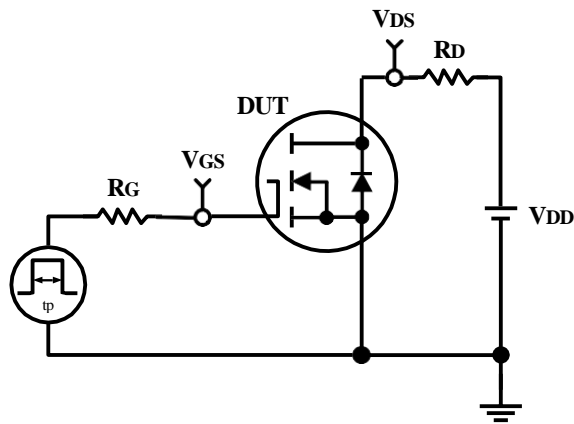
V<sub>SD</sub> - Source - Drain Voltage (V)



## Avalanche Test Circuit and Waveforms



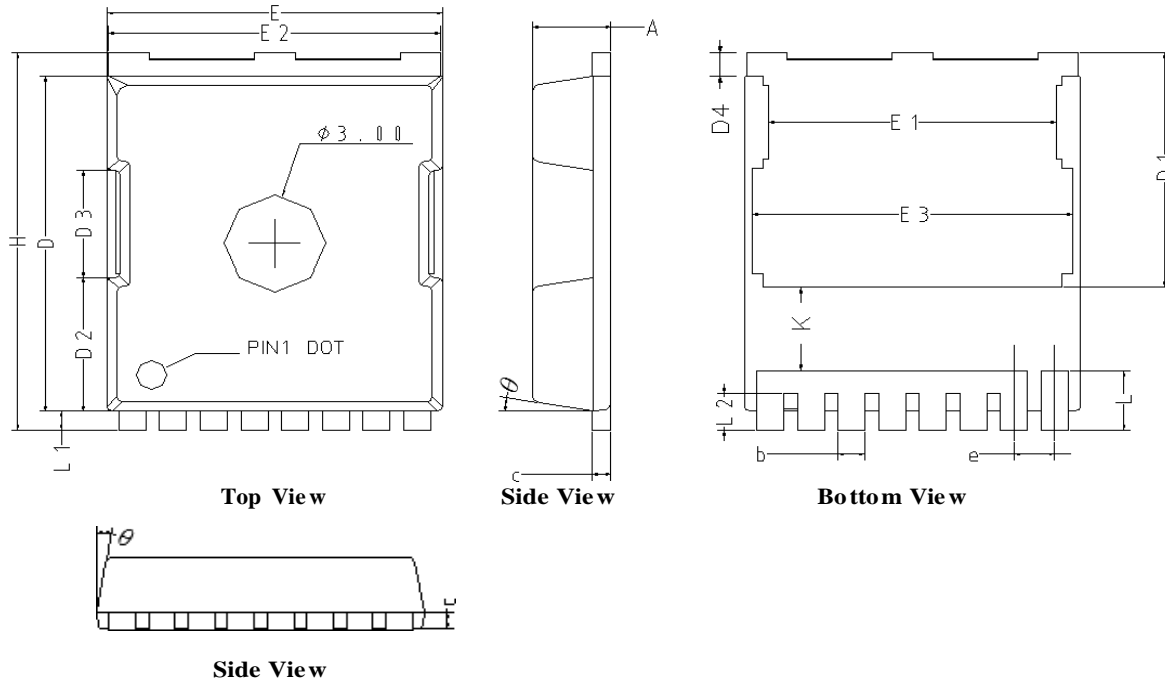
## Switching Time Test Circuit and Waveforms





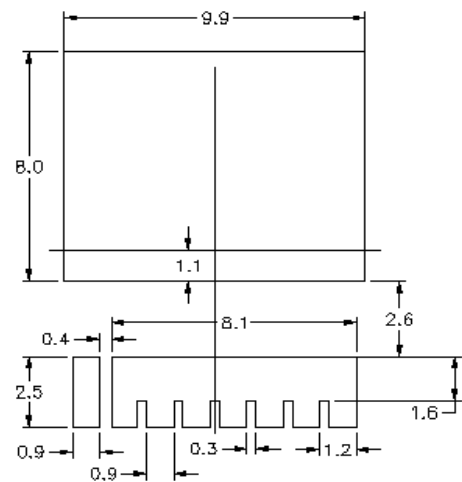
## Package Information

### TOLL



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
$\theta$	6°	10°	6°	10°

### RECOMMENDED LAND PATTERN



UNIT: mm