

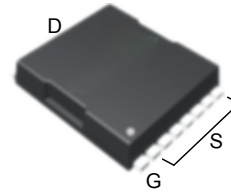
Features

- 120V/380A
 $R_{DS(ON)}=1.5m\Omega(typ.)@V_{GS}=10V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

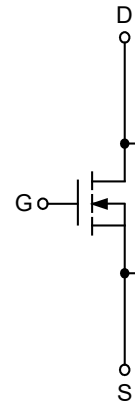
Applications

- Brushed motor drive applications
- BLDC motor drive applications
- Half-bridge and full-bridge topologies
- Synchronous rectifier applications
- DC/DC and AC/DC converters

Pin Description



TOLL



N-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		120	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	
I _S	Diode Continuous Forward Current	T _C =25°C	380	A
I _D	Continuous Drain Current	T _C =25°C	380	A
		T _C =100°C	285	
I _{DM} ^a	Pulsed Drain Current	T _C =25°C	1140	
P _D	Maximum Power Dissipation	T _C =25°C	375	W
		T _C =100°C	187	
R _{θJC}	Thermal Resistance-Junction to Case		0.4	°C/W
R _{θJA} ^c	Thermal Resistance-Junction to Ambient		50	°C/W
I _{AS} ^b	Avalanche Current, Single pulse	L=0.5mH	75	A
E _{AS} ^b	Avalanche Energy, Single pulse	L=0.5mH	1407	mJ

Note a : Pulse width limited by maximum junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature (initial temperature $T_J=25^{\circ}\text{C}$).

Note c : Surface Mounted on 1in^2 pad area.

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

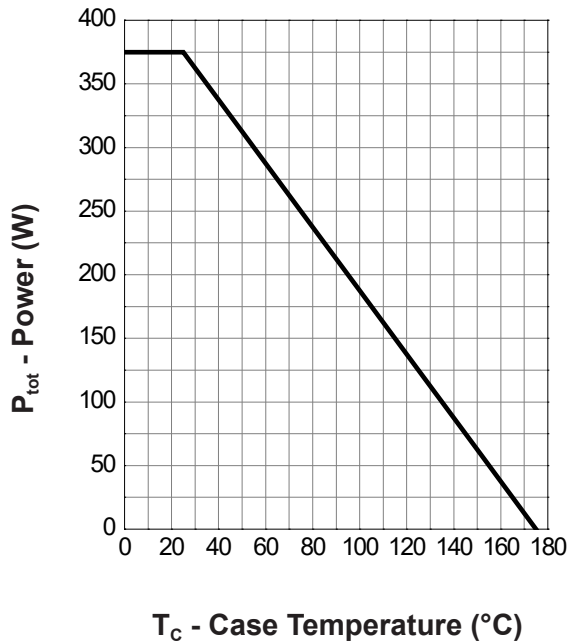
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	120	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =96V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	2	3.0	4	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} =100A	-	1.5	1.8	mΩ
Diode Characteristics						
V _{SD} ^d	Diode Forward Voltage	I _{SD} =50A, V _{GS} =0V	-	0.8	1.1	V
t _{rr} ^e	Reverse Recovery Time	I _{SD} =100A, dI _{SD} /dt=100A/μs	-	88	-	ns
Q _{rr} ^e	Reverse Recovery Charge		-	210	-	nC
Dynamic Characteristics ^e						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,f=1MHz	-	1.5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =60V, Frequency=1.0MHz	-	9970	13140	pF
C _{oss}	Output Capacitance		-	4580	-	
C _{rss}	Reverse Transfer Capacitance		-	95	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =30Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	45	81	ns
t _r	Turn-on Rise Time		-	31	56	
t _{d(OFF)}	Turn-off Delay Time		-	117	211	
t _f	Turn-off Fall Time		-	307	553	
Gate Charge Characteristics ^e						
Q _g	Total Gate Charge	V _{DS} =60V, V _{GS} =10V, I _{DS} =100A	-	125	188	nC
Q _{gs}	Gate-Source Charge		-	49	-	
Q _{gd}	Gate-Drain Charge		-	27	-	

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

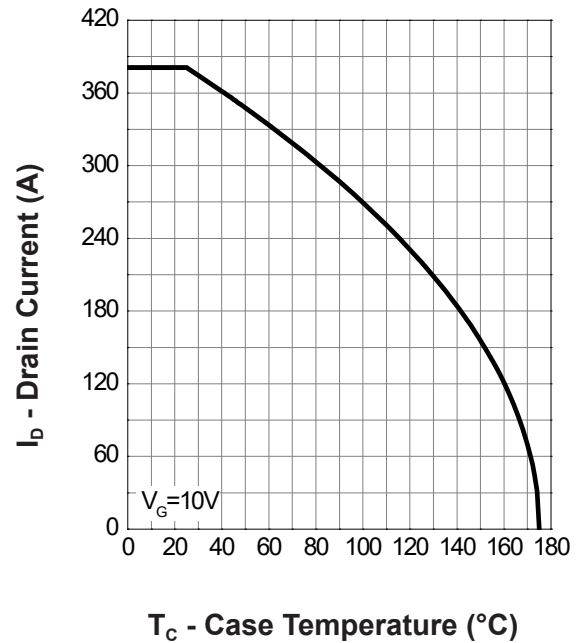
Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

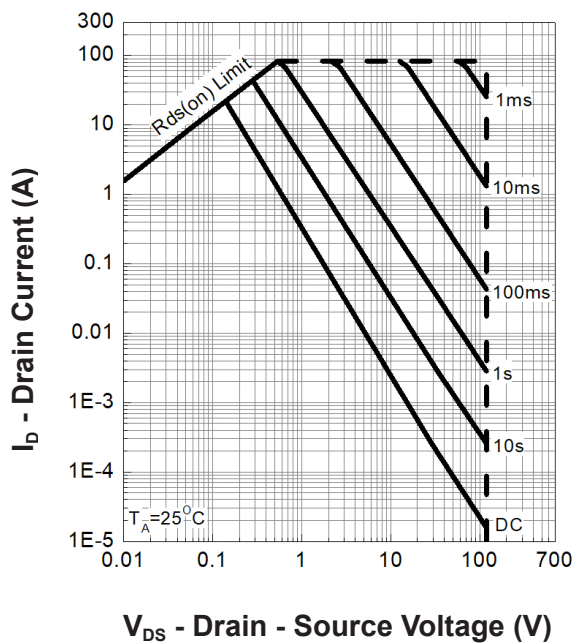
Power Dissipation



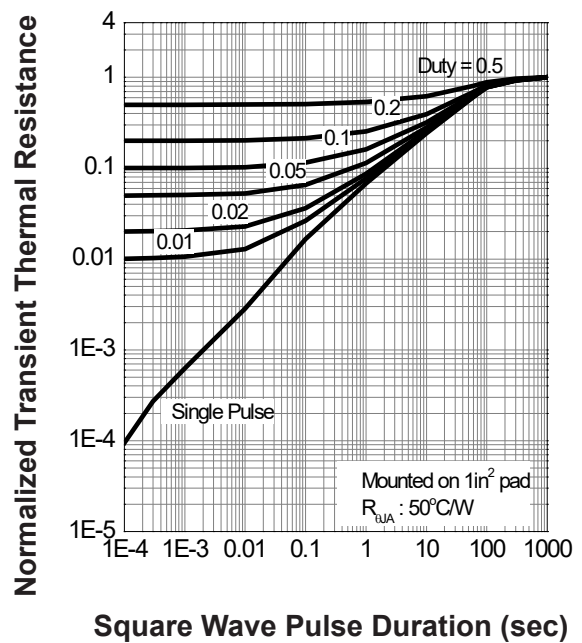
Drain Current



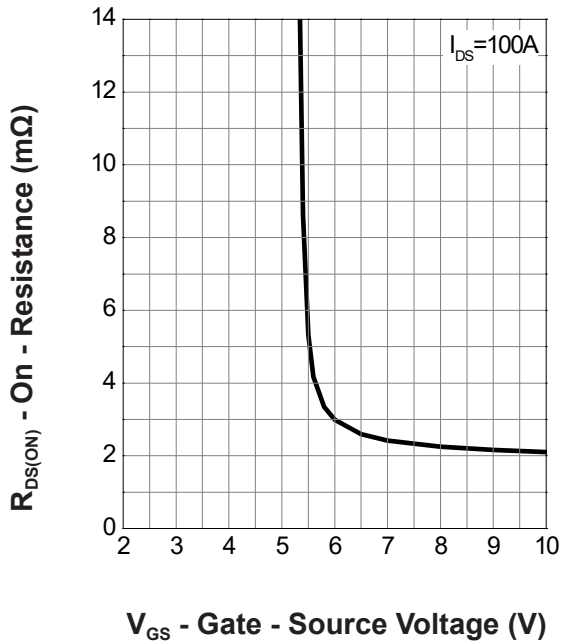
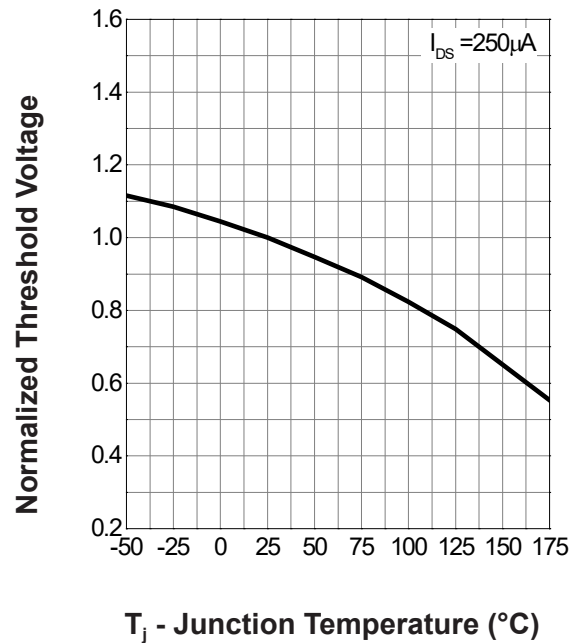
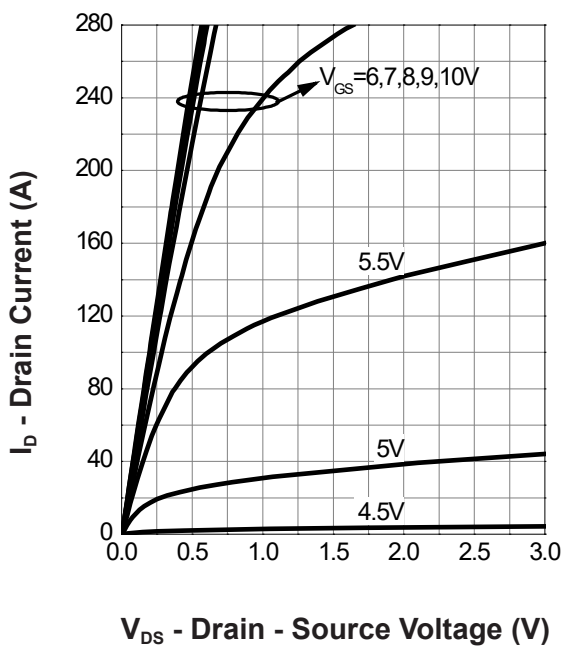
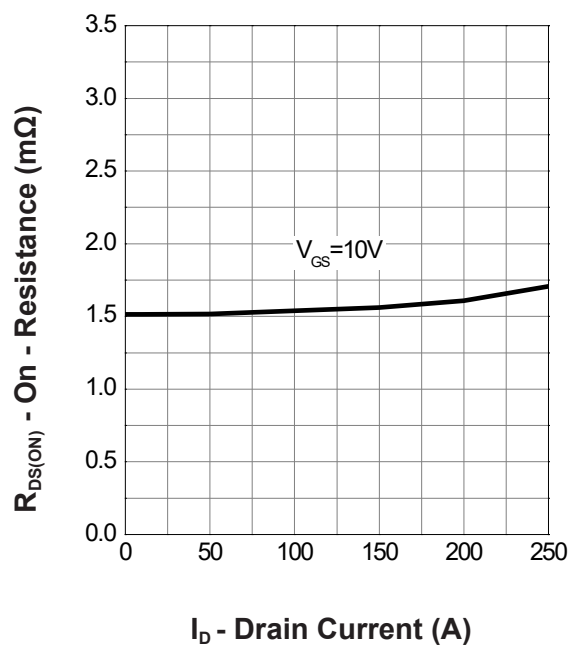
Safe Operation Area



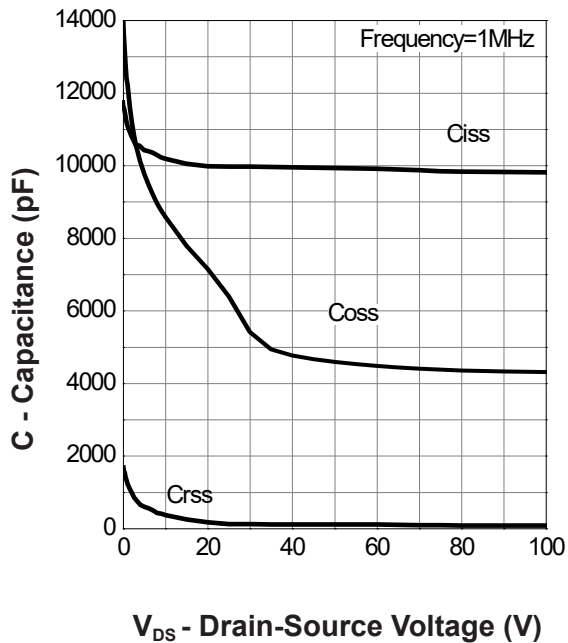
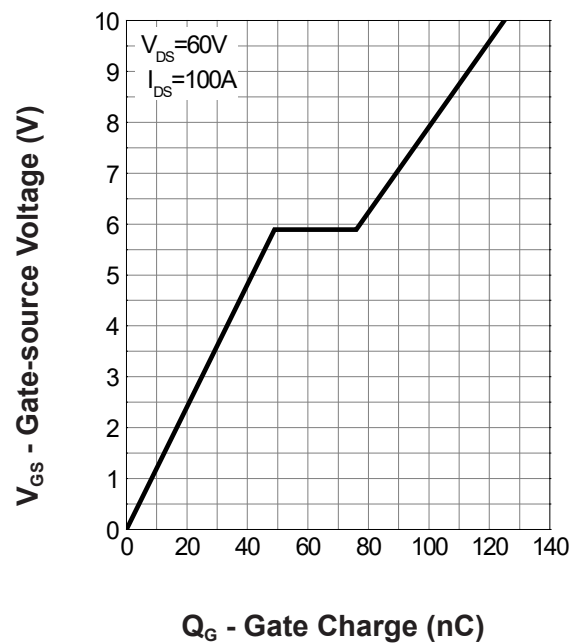
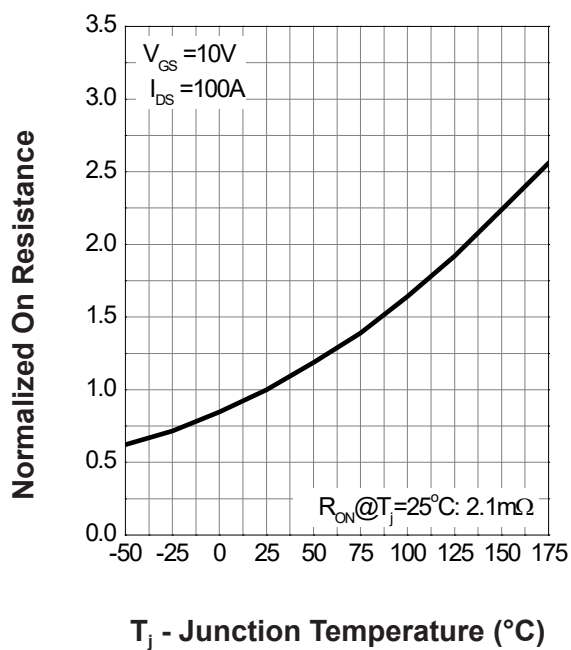
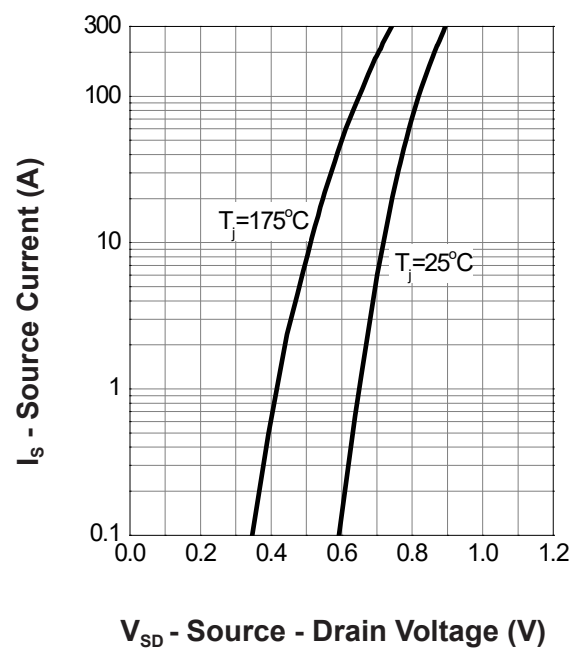
Thermal Transient Impedance



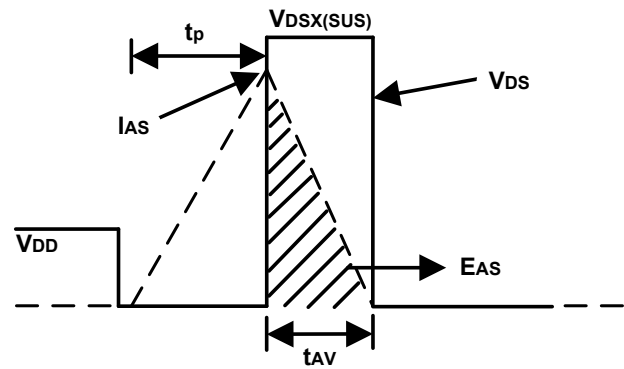
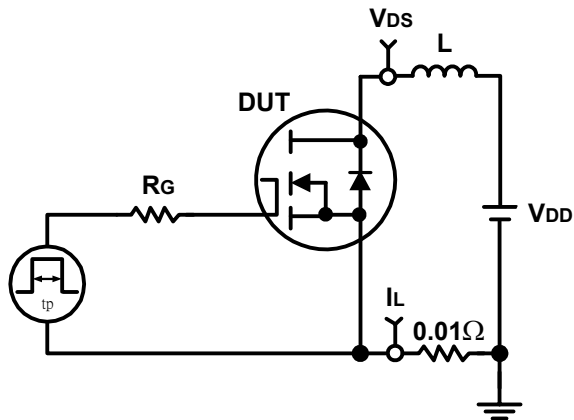
Typical Operating Characteristics(Cont.)

Gate-Source On Resistance

Gate Threshold Voltage

Output Characteristics

Drain-Source On Resistance


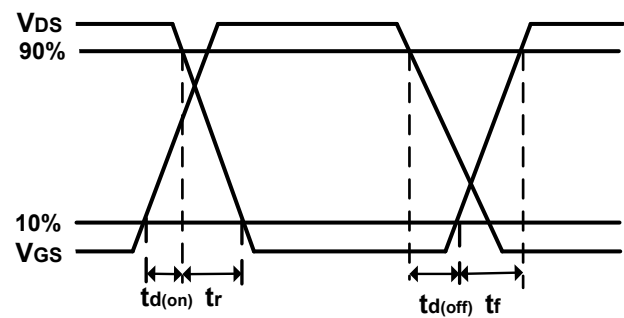
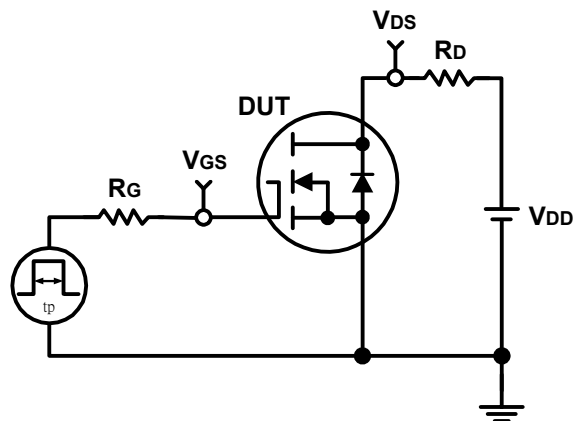
Typical Operating Characteristics(Cont.)

Capacitance

Gate Charge

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms

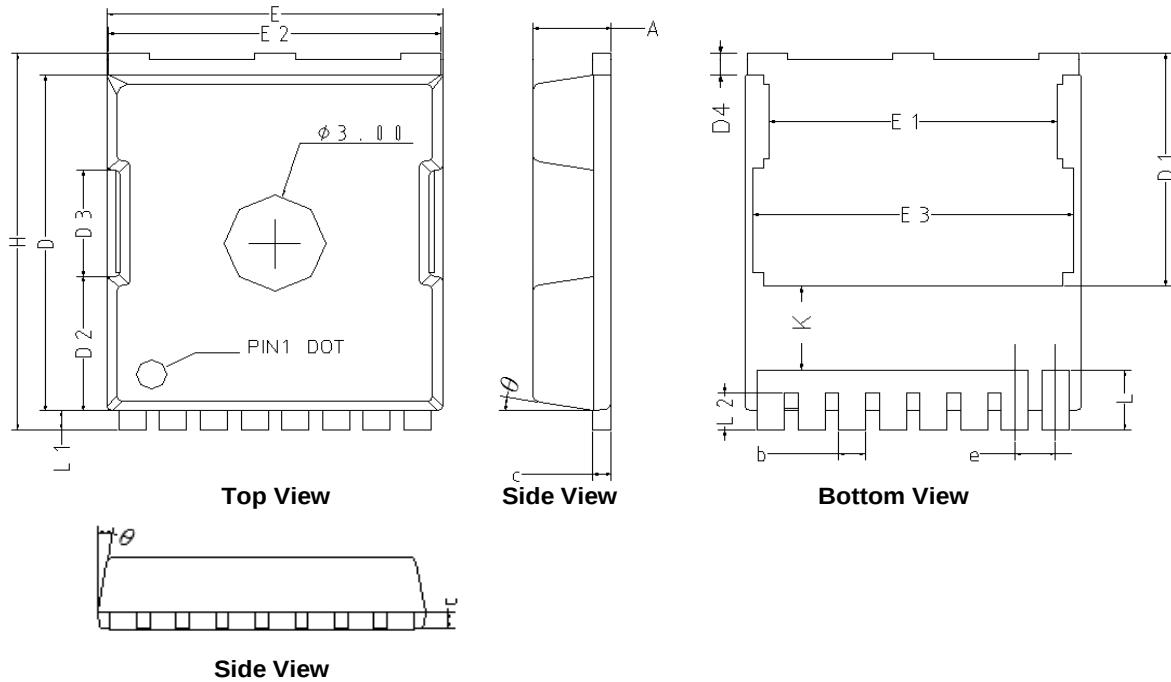


Switching Time Test Circuit and Waveforms



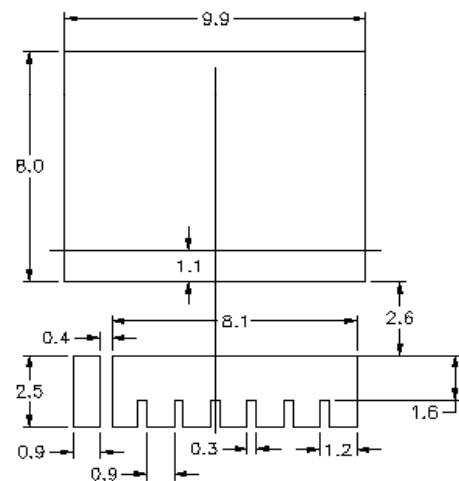
Package Information

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
θ	6°	10°	6°	10°

RECOMMENDED LAND PATTERN



UNIT: mm