PCSL016N08NL is 80V/ 1.6mΩ N-Channel SGT MOSFET TOLL-1L

General Description

PingChuang SGT MOSFET is a new type of power semiconductor device. It has the advantages of low conduction losses of traditional, low switching losses. SGT MOSFET as a switching device is used in new energy electric vehicles, new photovoltaic power generation, energy-saving home appliances and other fields of motor drive systems, inverter systems and power management systems.

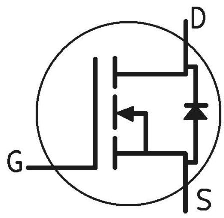
PCSL016N08NL Summary

Symbol	Value
V_{DS}	80V
$R_{DS(on)type}$	1.6mΩ
I_D@25°C	260A
I_D@100°C	184A
$Q_{G(typ.)}$	215nC

Features

- Low Gate Charge
- Low C_{iss}
- Fast Switching
- 100% Avalanche Tested
- Improved dv/dt Capability
- RoHS 2.0 Compliant

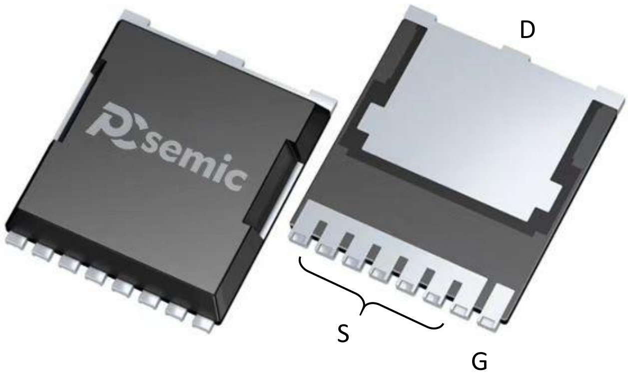
Equivalent Schematic



Applications

- Motor Drive Systems
- Power Management Systems
- Inverter Systems

Package TOLL-1L



Package Marking

Product#	Marking	Package
PCSL016N08NL	PCSL016N08NL	TOLL-1L

Maximum Ratings (T_C = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current	260	A
I_D	Package Limited	300	A
I_D	Continuous Drain Current(T_C = 100°C)	184	A
$I_{D(pulse)}$	Pulsed Drain Current	1040	A
E_{AS}	Single Pulse Avalanche Energy	441	mJ
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
T_L	Maximum Lead Temperature for Soldering Purposes, 1/8"from Case for 5 Seconds	260	°C

Thermal Characteristics

Symbol	Parameter	Value	Unit
R_{thJC}	Thermal Resistance , Junction to Case	0.65	℃/W
P_D	Maximum Power Dissipation,T_C=25℃	230	W

Electrical Characteristics

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	80			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=80V, V_{GS}=0V			1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{DS}=0V, V_{GS}=20V			100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{DS}=0V, V_{GS}=-20V			-100	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	2.0	3.0	4.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=20A		1.6	2.2	mΩ
C_{iss}	Input Capacitance	V_{GS}=0V V_{DS}=25V f=1 MHz		13220		pF
C_{oss}	Output Capacitance			2500		pF
C_{rss}	Reverse Transfer Capacitance			146		pF
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=40V V_{GS}=10V R_G =10Ω R_L=1Ω		38		ns
t_r	Turn-On Rise Time			132		ns
$t_{d(off)}$	Turn-Off Delay Time			126		ns
t_f	Turn-Off Fall Time			153		ns
Q_G	Total Gate Charge	V_{DS}=48V V_{GS}=10V I_D=20A		215		nC
Q_{GS}	Gate to Source Charge			68		nC
Q_{GD}	Gate to Drain Charge			46		nC
V_{SD}	Diode Forward Voltage	I_S=20A,V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	V_{DS}=30V,I_F =5A dI_F/dt=100A/μs		120		ns
Q_{rr}	Reverse Recovery Charge			281		nC

Notes

1. Repetitive Rating:pulse width limited by maximum junction temperature.
2. L=0.5mH,Rg=25Ω, starting T_J=25℃.
3. Pulse width≤300us;duty cycle≤2%.

Typical Performance

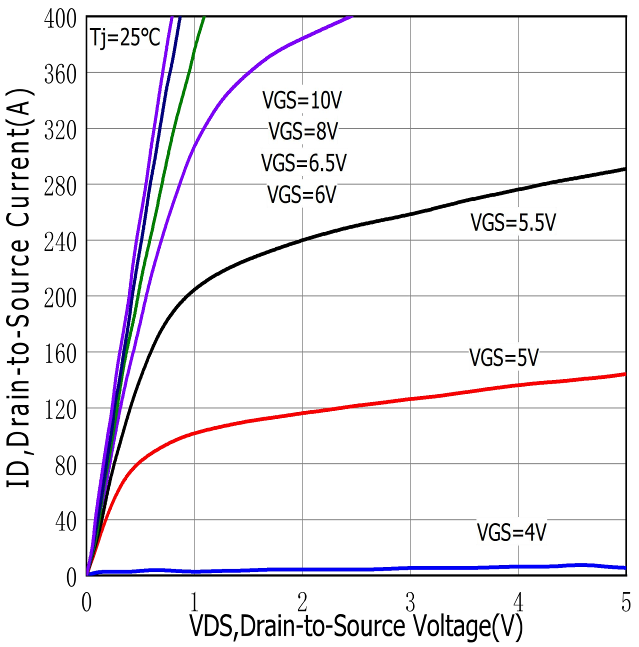


Figure1: Typical Output Characteristics

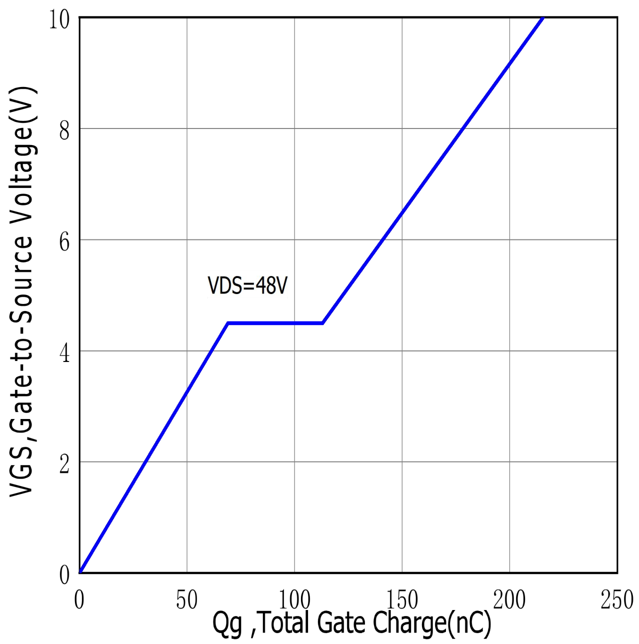


Figure 2: Typical Gate Charge vs Gate to Source Voltage

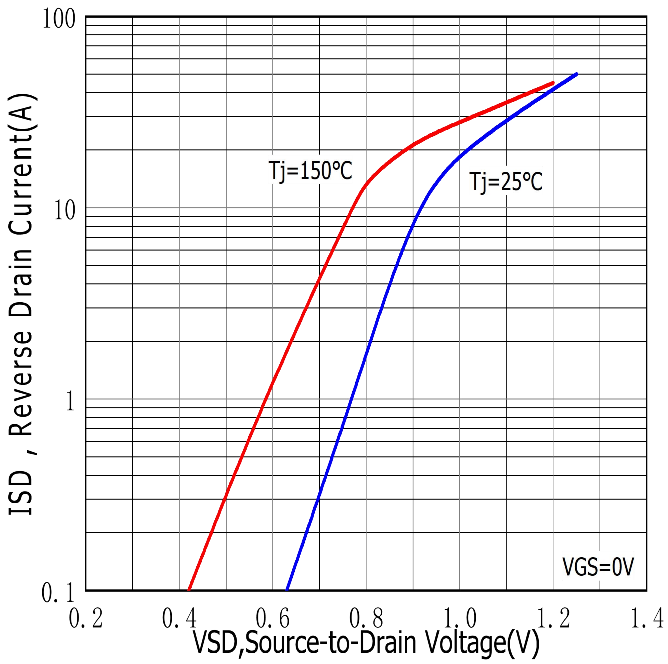


Figure 3: Typical Body Diode Transfer Characteristics

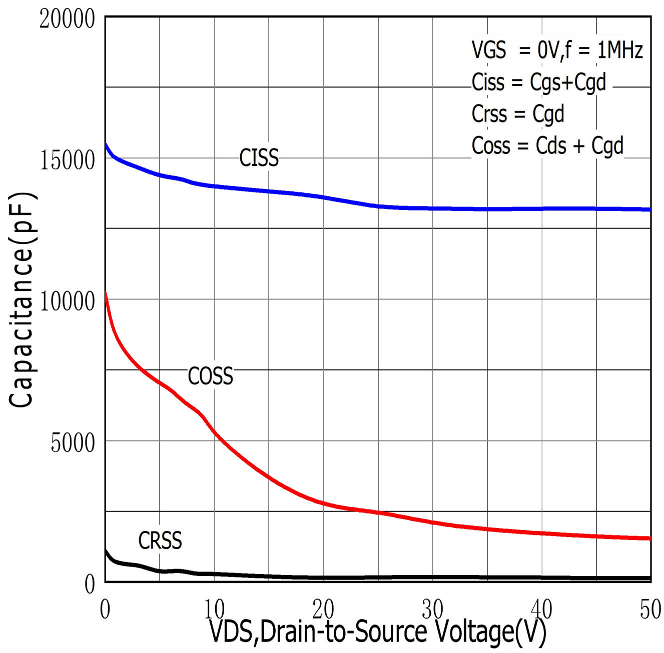


Figure 4: Typical Capacitance vs Drain to Source Voltage

Typical Performance

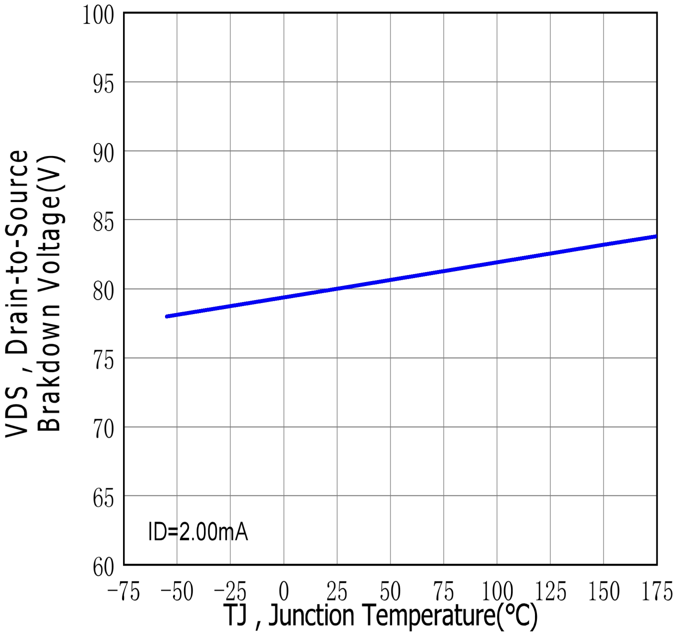


Figure 5: Typical Breakdown Voltage vs Junction Temperature

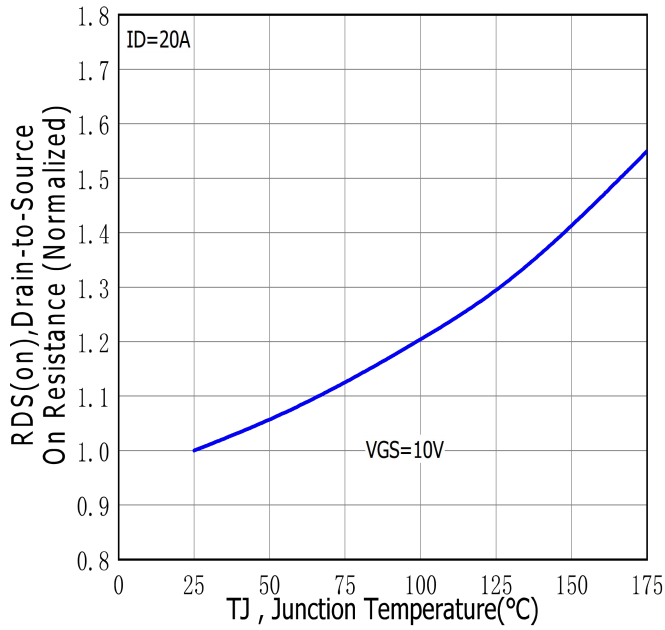


Figure 6: Typical Drain to Source on Resistance vs Junction Temperature

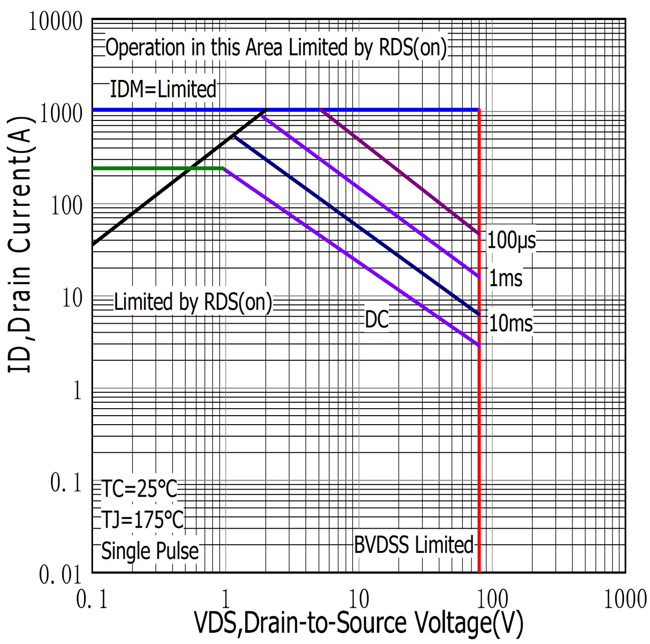


Figure 7: Maximum Forward Bias Safe Operating Area

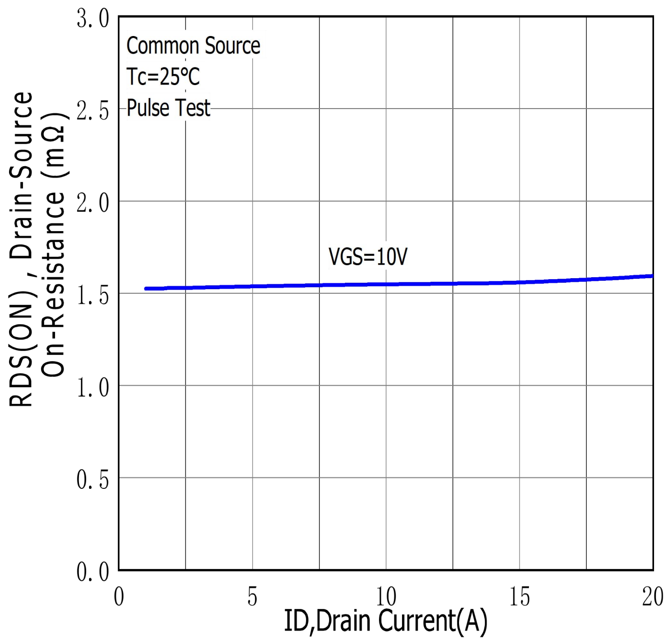


Figure 8: Typical Drain to Source on Resistance vs Drain Current

Typical Performance

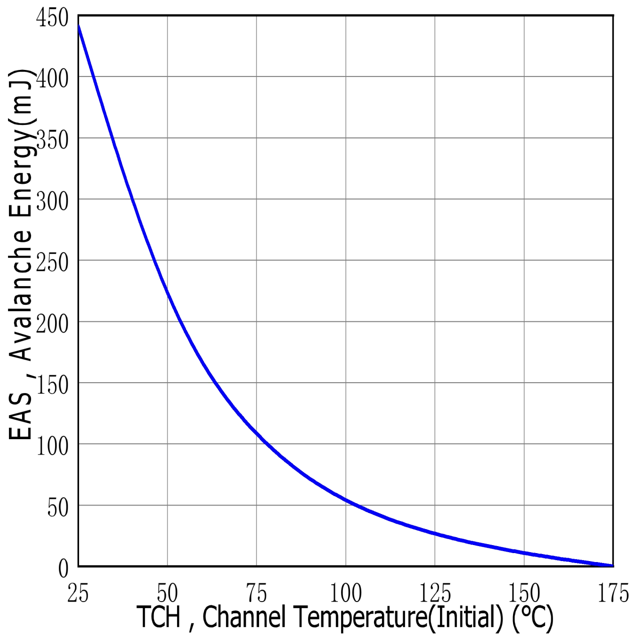


Figure 9: Maximum EAS vs Channel Temperature

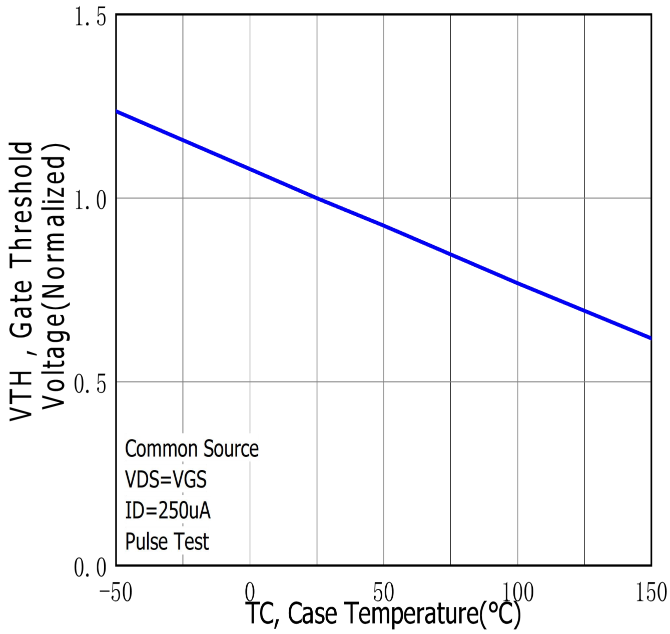


Figure 10: Typical Threshold Voltage vs Case Temperature

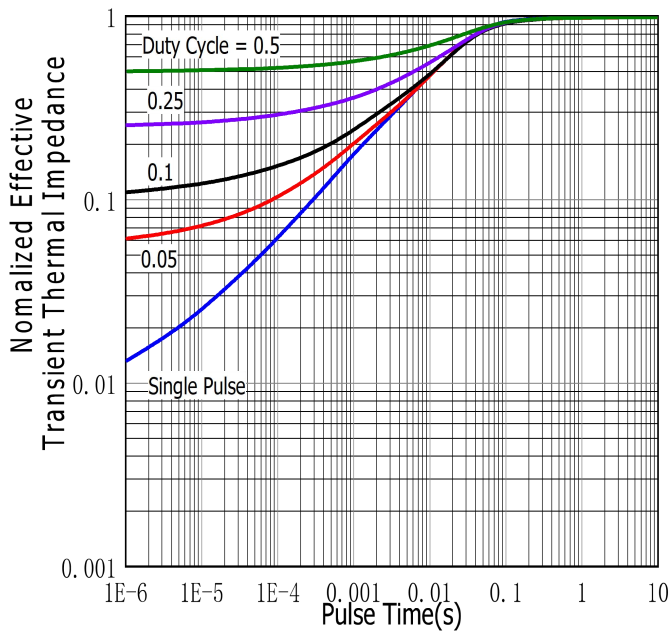


Figure 11: Maximum Effective Thermal Impedance , Junction to Case

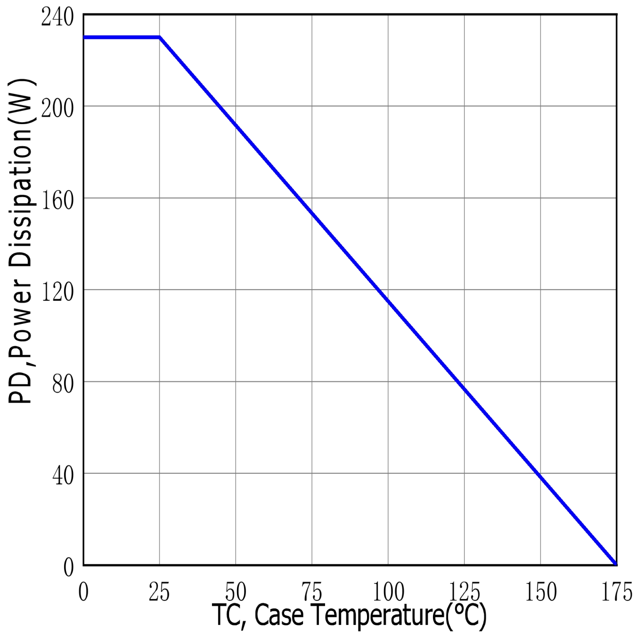
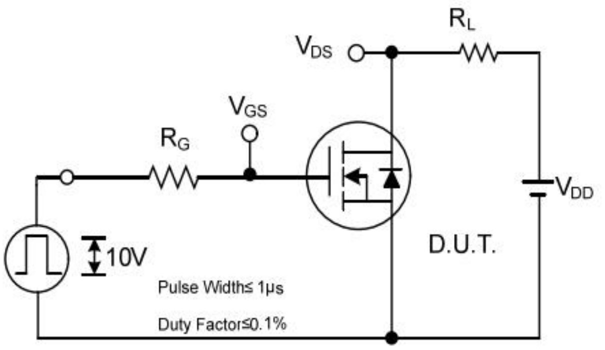
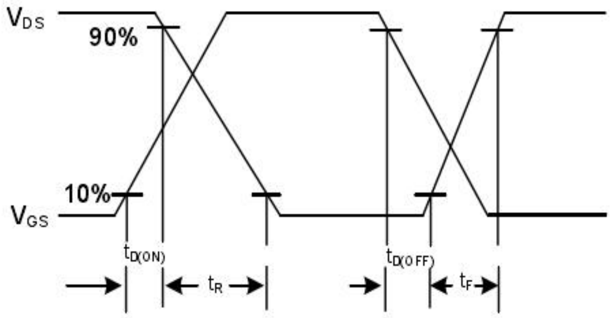


Figure 12: Maximum Power Dissipation vs Case Temperature

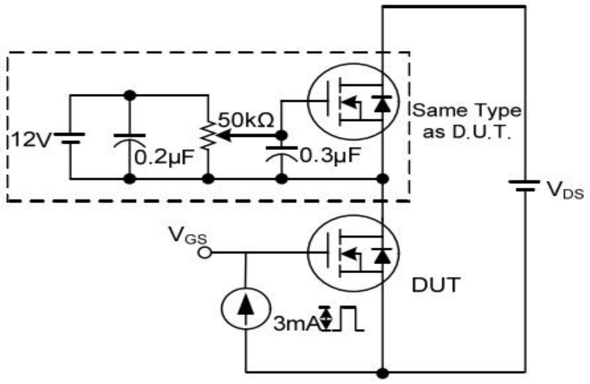
Test Circuit and Waveform



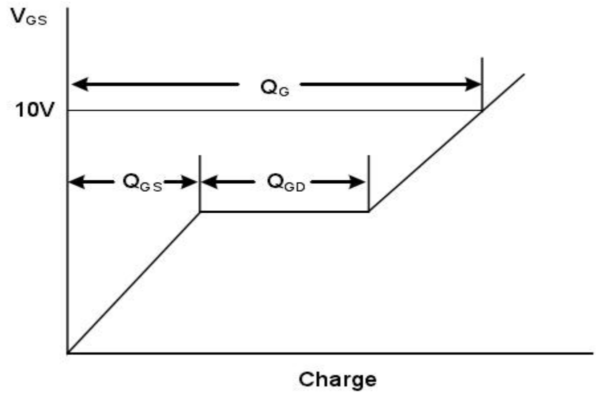
Switching Test Circuit



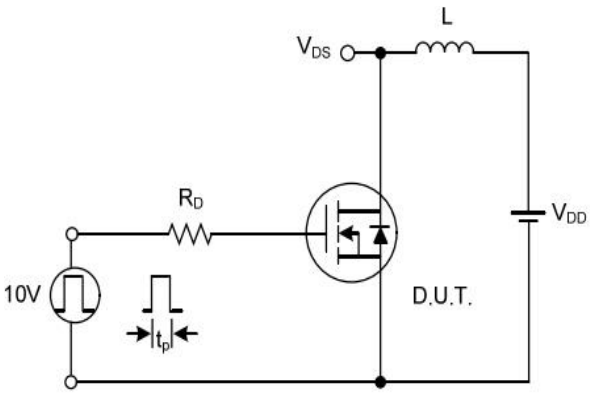
Switching Waveforms



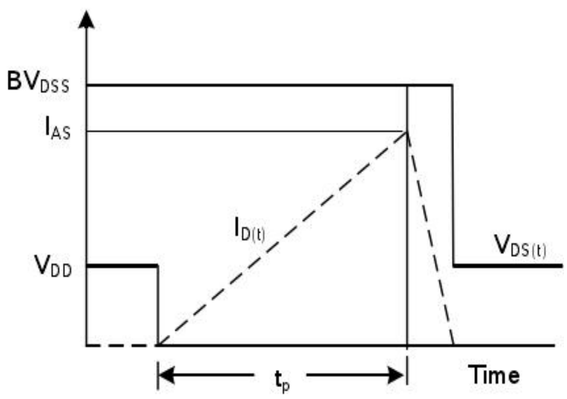
Gate Charge Test Circuit



Gate Charge Waveform

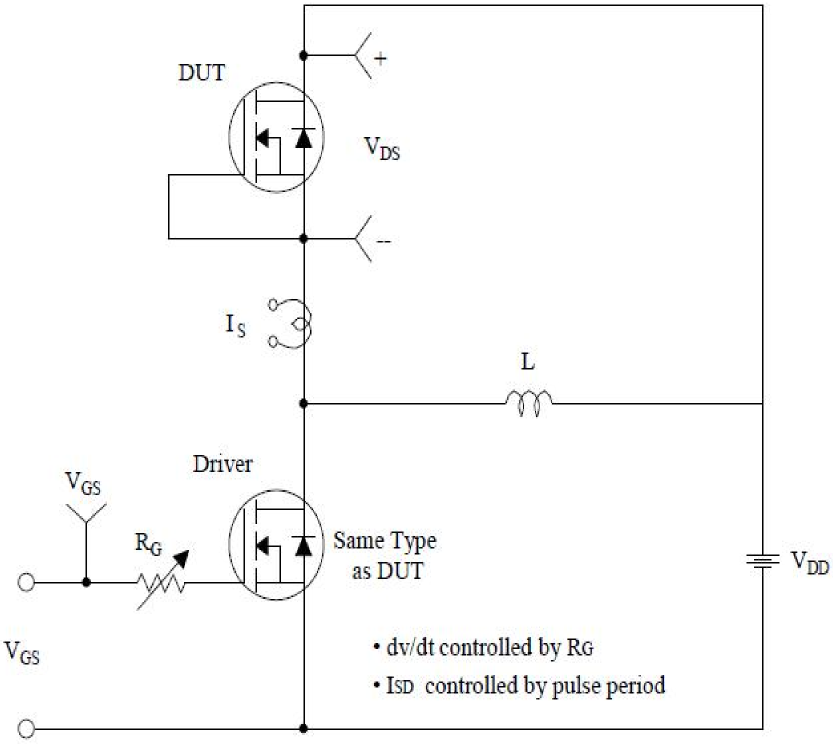


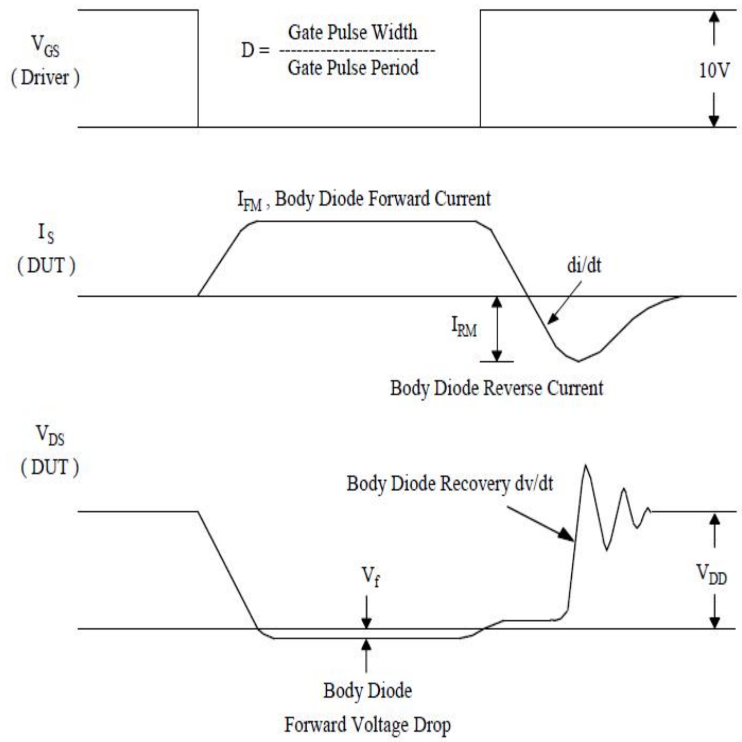
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

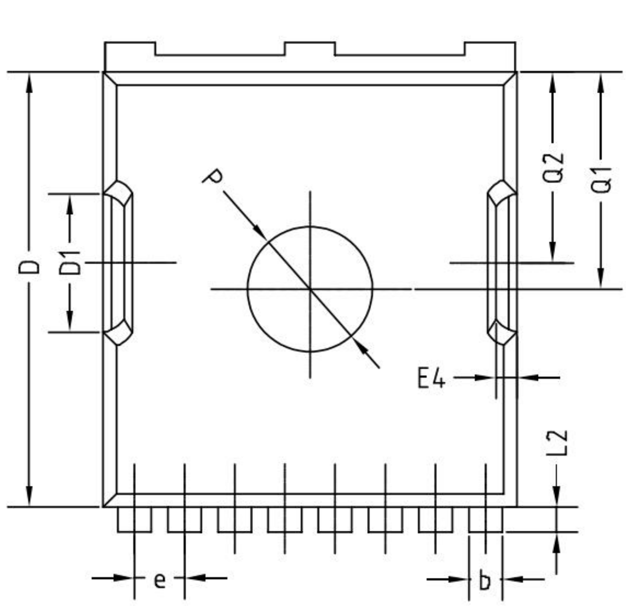
Test Circuit and Waveform

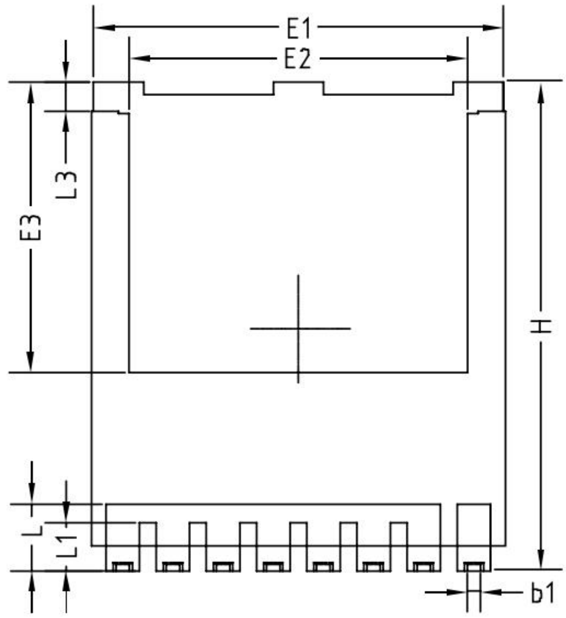


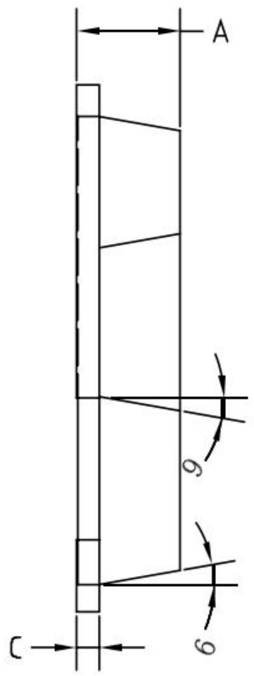


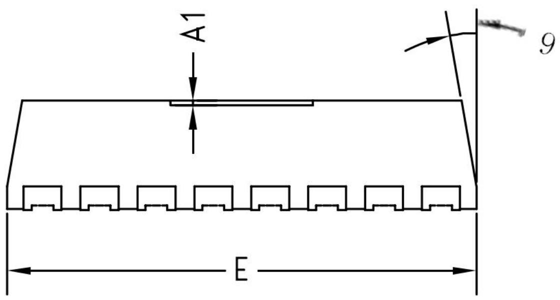
Package Dimensions

TO-TOLL-1L









DIM	MILLIMETERS			INCHES		
	MIN	NOR	MAX	MIN	NOR	MAX
A	2.20	2.30	2.40	0.087	0.091	0.094
A1	0.05	0.10	0.20	0.00	0.004	0.008
b	0.65	0.80	0.85	0.026	0.031	0.033
b1	0.30	0.40	0.50	0.012	0.016	0.020
C	0.35	0.46	0.65	0.014	0.018	0.026
D	10.35	10.55	10.70	0.407	0.415	0.421
D1	3.15	3.30	3.45	0.124	0.130	0.136
E	9.80	9.90	10.00	0.386	0.390	0.394
E1	9.65	9.80	9.95	0.380	0.386	0.392
E2	7.90	8.10	8.30	0.311	0.319	0.327
E3	6.80	7.00	7.20	0.268	0.276	0.283
E4	0.30	0.50	0.75	0.012	0.02	0.03
e	1.15	1.20	1.25	0.045	0.047	0.049
L	1.35	1.60	1.85	0.053	0.063	0.073
L1	0.95	1.20	1.35	0.037	0.045	0.053
L2	0.40	0.60	0.80	0.016	0.024	0.031
L3	0.60	0.70	0.85	0.024	0.024	0.031
θ	7°	10°	12°	7°	10°	12°
P	2.90	3.00	3.10	0.114	0.118	0.122
Q	4.50	4.60	4.70	0.177	0.181	0.185
Q1	5.10	5.20	5.30	0.201	0.205	0.209
H	11.55	11.70	11.95	0.455	0.461	0.470

UNIT:mm

IMPORTANT NOTICE

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