



# 富满微电子集团股份有限公司

FINE MADE MICROELECTRONICS GROUP CO., LTD.

45N18(文件编号: S&CIC2009)

N-Channel Trench Power MOSFET

## Description

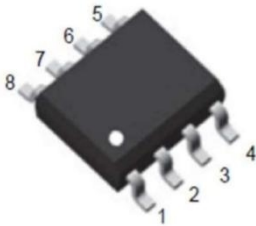
### Features

- 45V,20A
- $R_{DS(ON)}=15m\Omega$  (Typ.) @  $V_{GS} = 10V$   
 $R_{DS(ON)}=18m\Omega$  (Typ.) @  $V_{GS} = 4.5V$
- High Density Cell Design for Ultra Low  $R_{DS(ON)}$
- Lead Free and Green Devices Available (RoHS Compliant)
- Excellent Package for Good Heat Dissipation

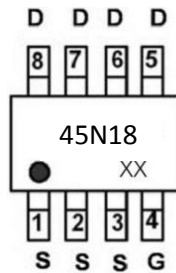
### Application

- DC/DC Converters
- Wireless charger
- Synchronous rectification

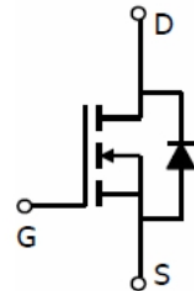
## Package



SOP-8



Marking and pin Assignment



Schematic diagram

## Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	45	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>c</sub> = 25°C	20
		T <sub>c</sub> = 100°C	12
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	80	A
E <sub>AS</sub>	Single Pulsed Avalanche Energy <sup>note2</sup>	16	mJ
P <sub>D</sub>	Power Dissipation	20	W
R <sub>θJC</sub>	Thermal Resistance, Junction to Case	4.6	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +175	°C

**Electrical Characteristics** ( $T_c=25^\circ\text{C}$  unless otherwise specified)

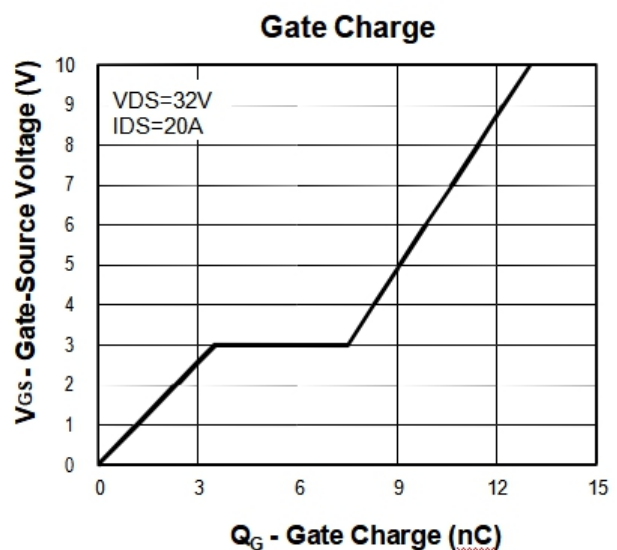
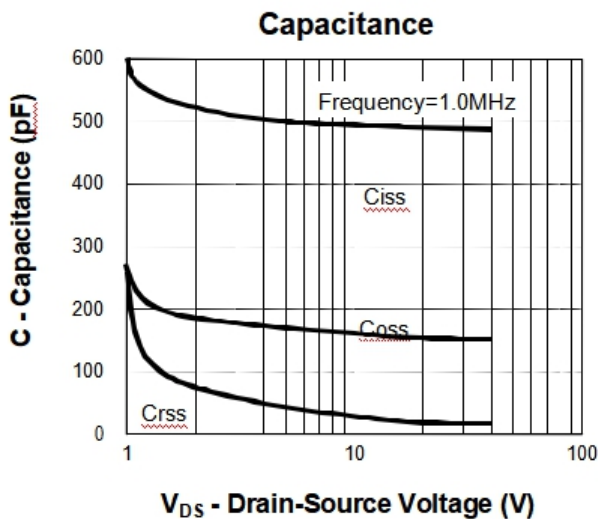
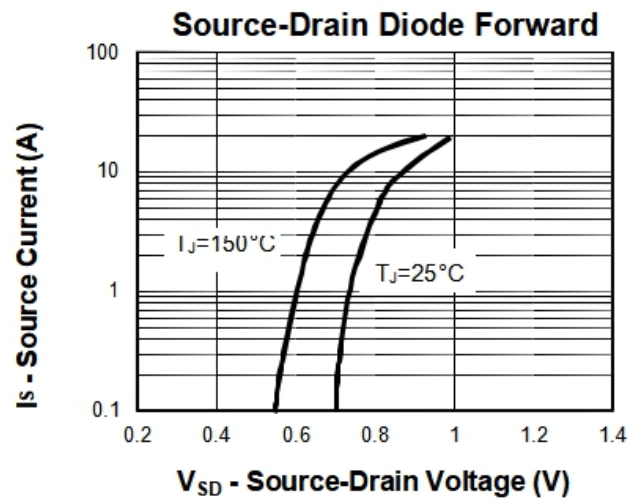
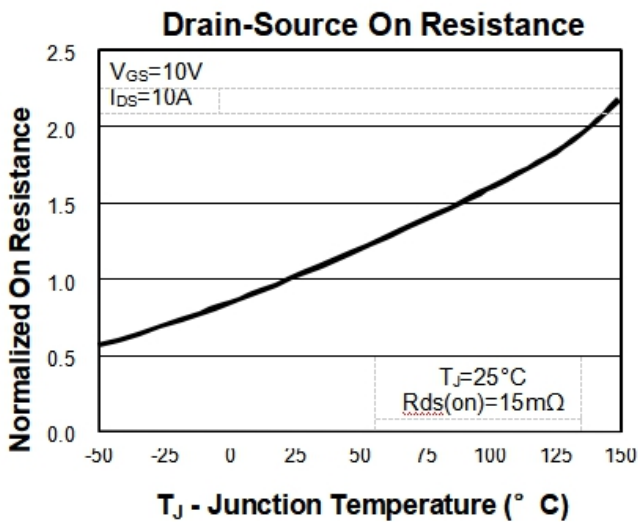
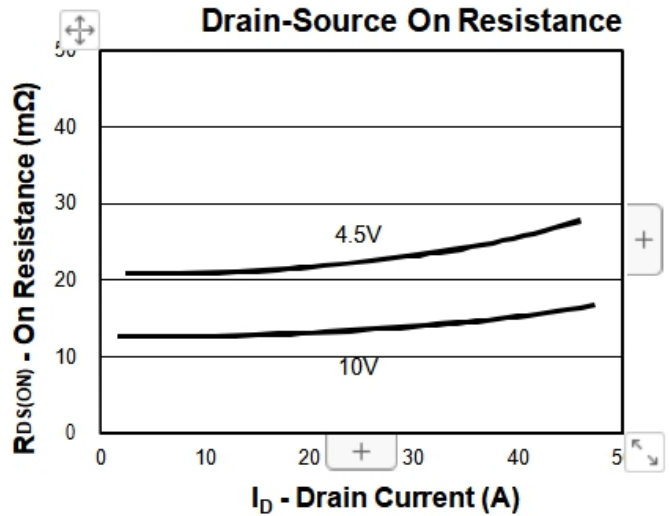
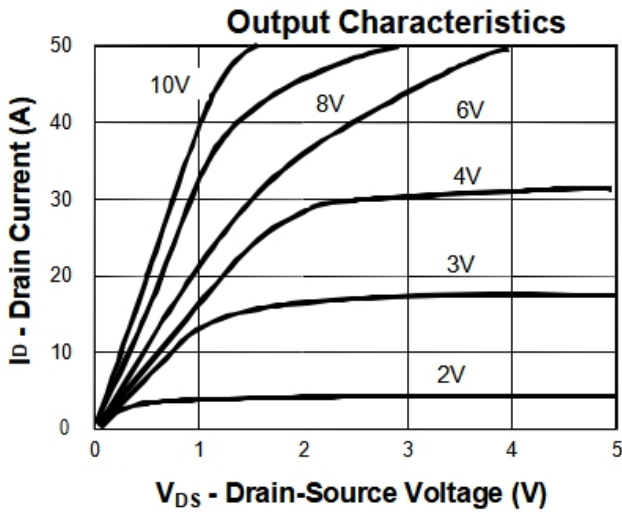
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	45	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=45V, V_{GS}=0V,$	-	-	1.0	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=15A$	-	15	20	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	-	18	24	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	560	-	pF
$C_{oss}$	Output Capacitance		-	128	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	56	-	pF
$Q_g$	Total Gate Charge	$V_{DS}=20V, I_D=20A,$ $V_{GS}=10V$	-	13.2	-	nC
$Q_{gs}$	Gate-Source Charge		-	3.8	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	6.2	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=20V, I_D=20A,$ $R_L=1\Omega, R_{GEN}=3\Omega,$ $V_{GS}=10V$	-	6	-	ns
$t_r$	Turn-on Rise Time		-	12	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	14	-	ns
$t_f$	Turn-off Fall Time		-	5	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	20	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	80	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=20A$	-	-	1.2	V
$t_{rr}$	Body Diode Reverse Recovery Time	$T_J=25^\circ\text{C},$ $I_F=20A, di/dt=100A/\mu s$	-	10	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge		-	16	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition:  $T_J=25^\circ\text{C}, V_{DD}=30V, V_G=10V, R_G=25\Omega, L=0.5\text{mH}$ 3. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty Cycle $\leq 0.5\%$

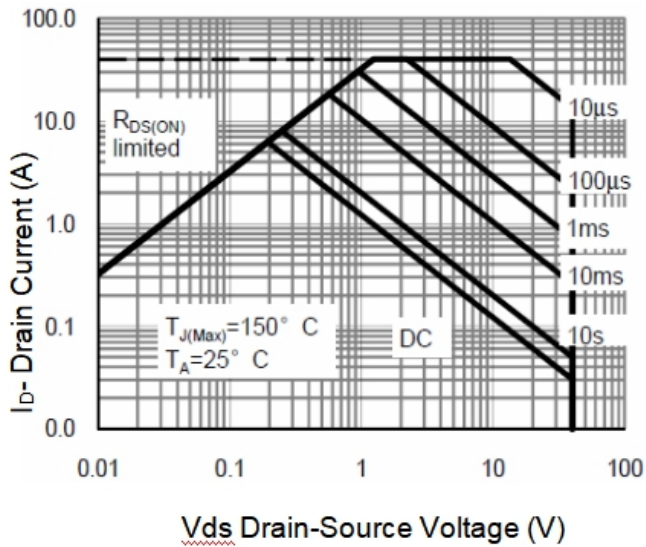


## Typical Characteristics

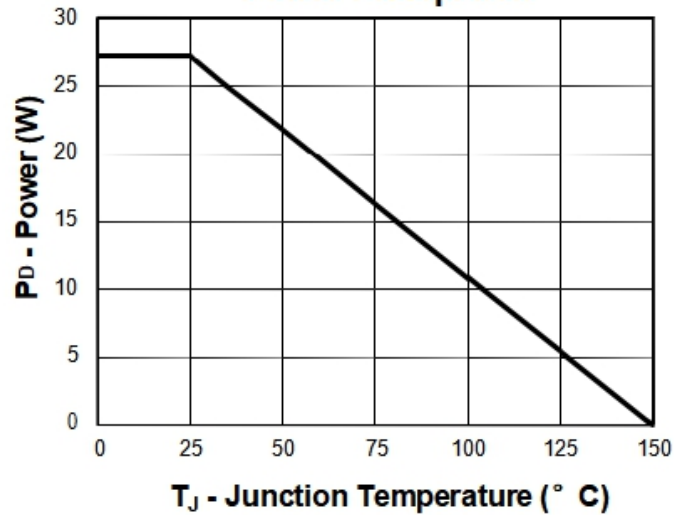




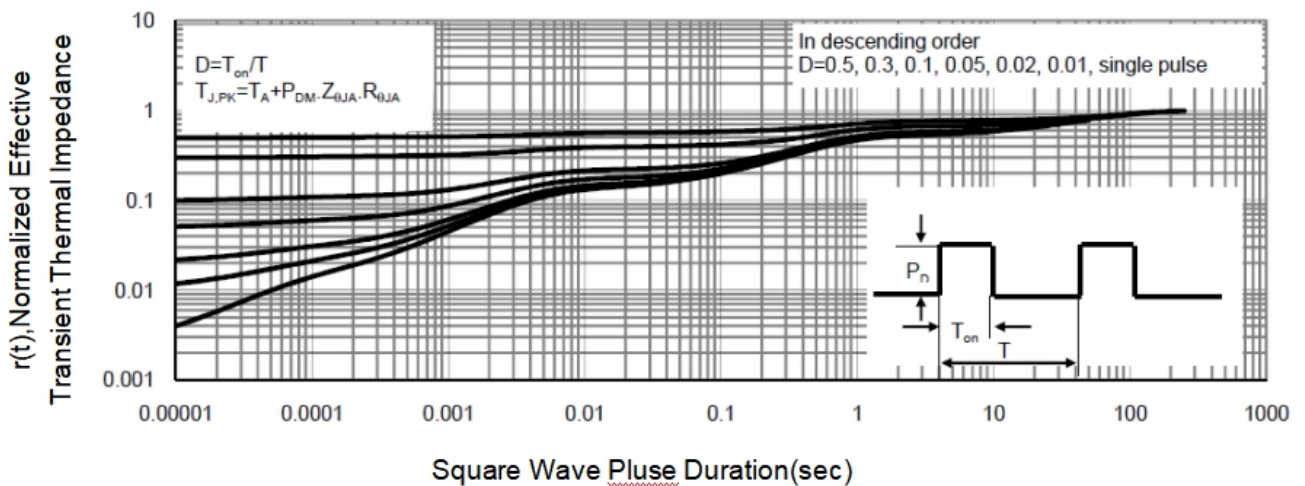
### Safe Operation Area



### Power Dissipation



### Thermal Transient Impedance



## Test Circuit

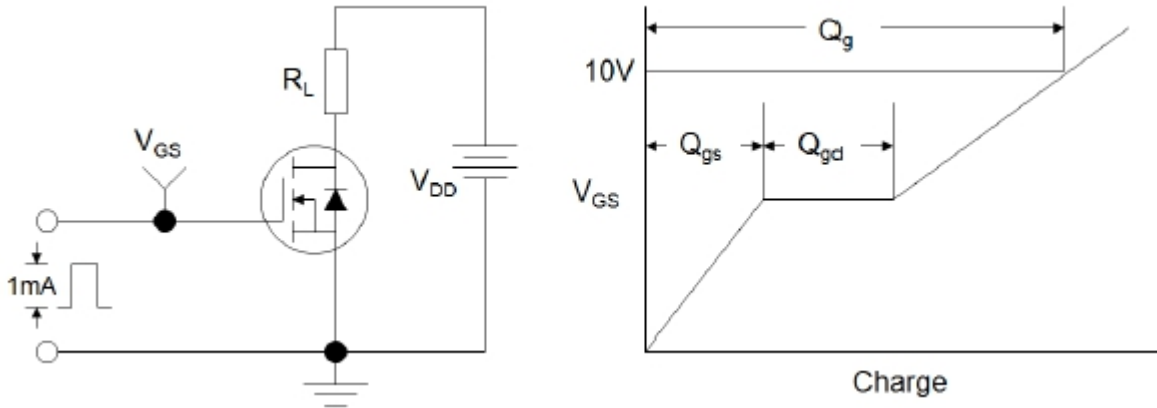


Figure1:Gate Charge Test Circuit & Waveform

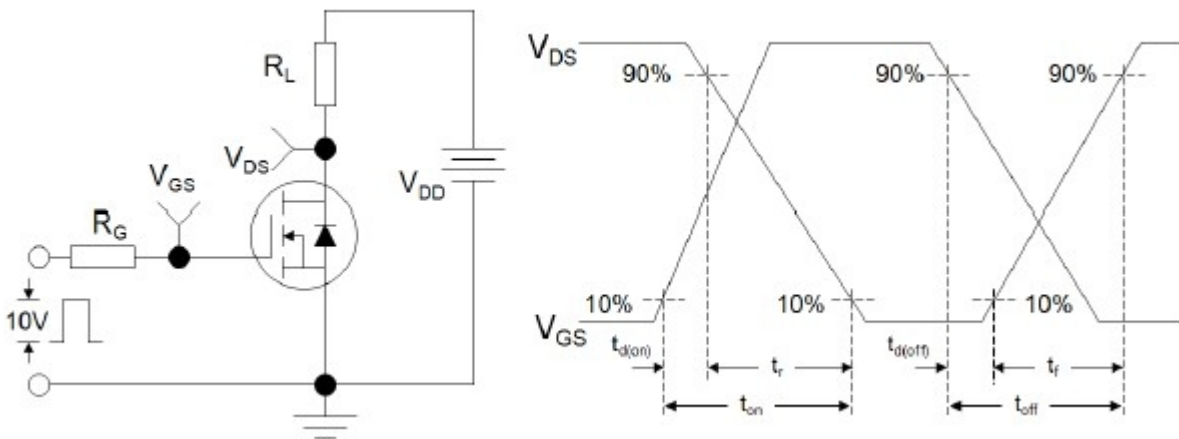


Figure 2: Resistive Switching Test Circuit & Waveforms

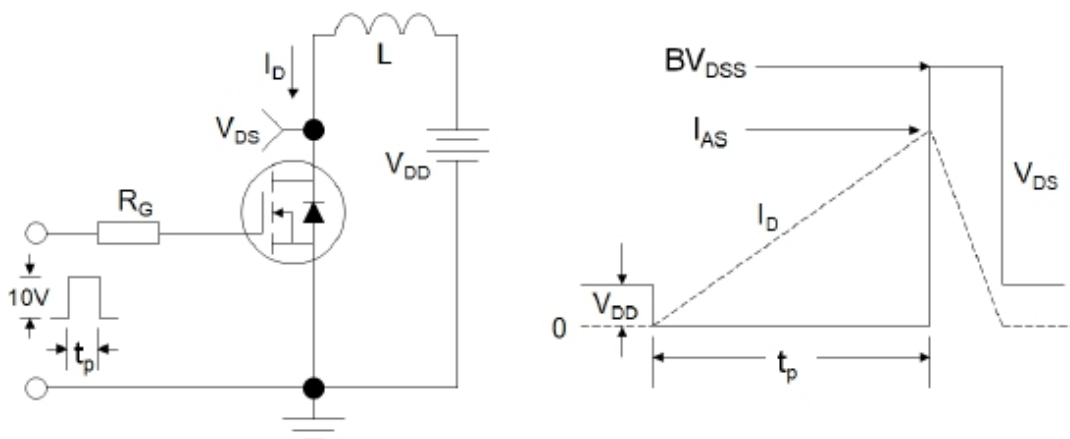


Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms

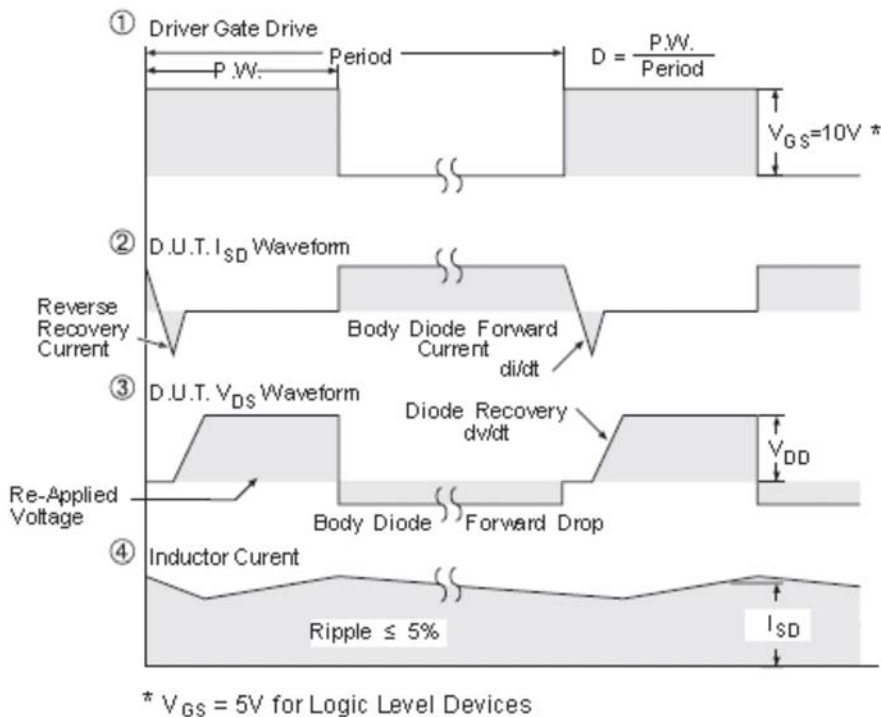
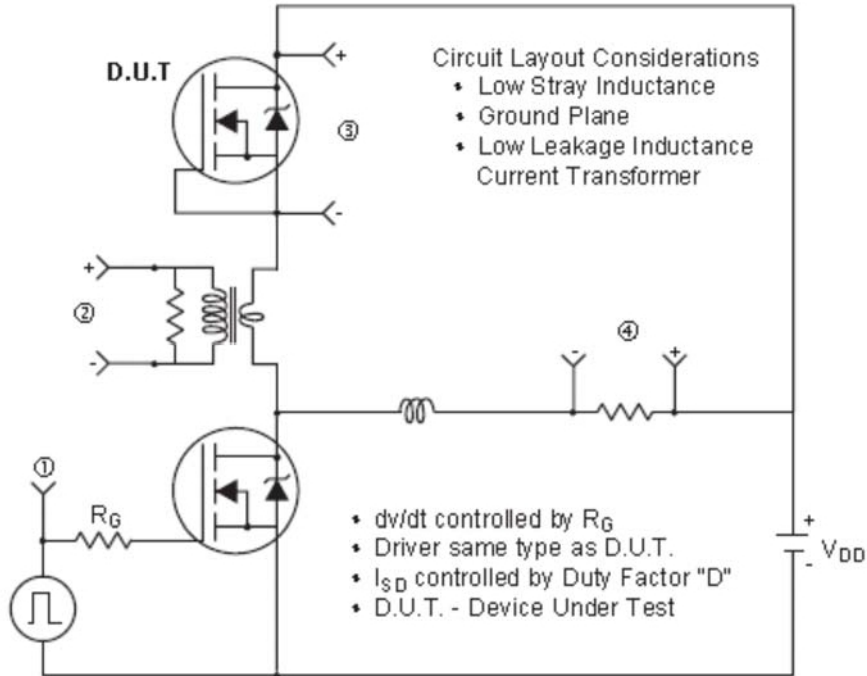


Figure 4: Peak Diode Recovery  $dv/dt$  Test Circuit & Waveforms (For N-channel)



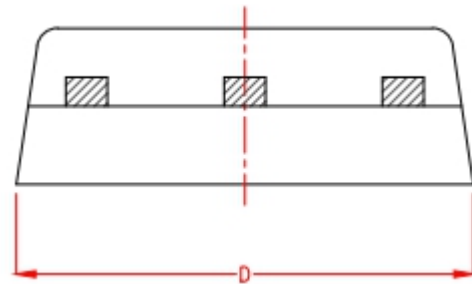
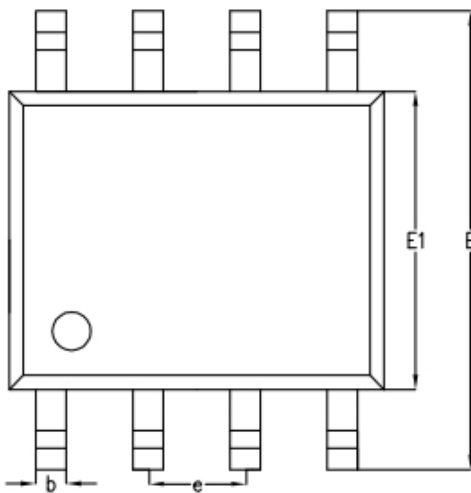
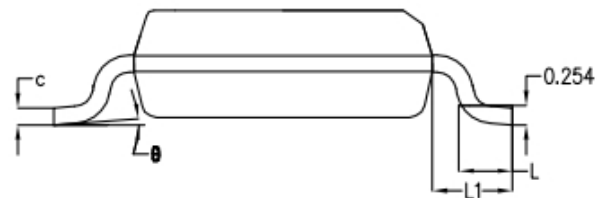
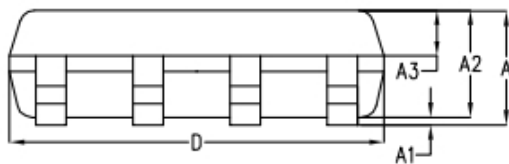
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## SOP-8 Package Information



符号	毫米		
	最小值	典型值	最大值
A	-	1.50	1.55
A1	-	0.10	0.15
A2	1.35	1.40	1.45
A3	0.55	0.60	0.65
b	0.35	0.40	0.45
c	0.17	0.22	0.25
D	4.85	4.90	4.95
E	5.90	6.00	6.10
E1	3.80	3.90	4.00
e	1.27BSC		
L	0.60	0.65	0.70
L1	1.05BSC		
θ	0°	4°	6°



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