

## N-Channel Enhancement Mode MOSFET

### Features

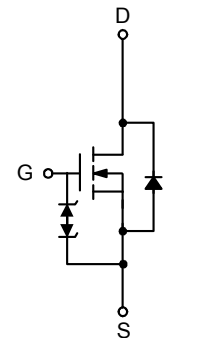
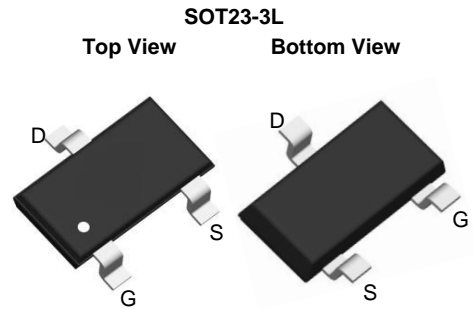
- 30V/4A
- $R_{DS(ON)}=40m\Omega$  (typ) @VGS=10V  
 $R_{DS(ON)}=45m\Omega$  (typ) @VGS=4.5V  
 $R_{DS(ON)}=60m\Omega$  (typ) @VGS=2.5V
- 100% UIS & RG Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

### Applications

- Power Management for Industrial DC/DC Converters

### Marking

Marking	A2****
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N-Channel MOSFET

### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Rating	Unit
<b>Common Ratings</b>			
$V_{DSS}$	Drain-Source Voltage	30	V
$V_{GSS}$	Gate-Source Voltage	$\pm 12$	
$I_D$	Continuous Drain Current ( $T_J=150^\circ\text{C}$ )	$V_{GS}=4.5\text{V}$ 4	A
$I_{DM}$	Pulsed Drain Current	15	
$I_S$	Diode Continuous Forward Current	1.5	A
$T_{STG}, T_J$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
PD	Power Dissipation	$T_A=25^\circ\text{C}$	W
		$T_A=70^\circ\text{C}$	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	90	$^\circ\text{C/W}$

## 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	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V	-	-	1	μA
		T <sub>j</sub> =55°C	-	-	5	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250μA	0.5	-	1.5	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±12V, V <sub>DS</sub> =0V	-	-	±100	nA
R <sub>DS(ON)</sub>	Drain-Source On-state Resistance	V <sub>GS</sub> =10V, I <sub>DS</sub> =4A	-	40	50	mΩ
		V <sub>GS</sub> =4.5V, I <sub>DS</sub> =3A	-	45	65	
		V <sub>GS</sub> =2.5V, I <sub>DS</sub> =2A	-	60	85	
<b>Body Diode Characteristics</b>						
V <sub>SD</sub>	Diode Forward Voltage	I <sub>SD</sub> =1A, V <sub>GS</sub> =0V	-	0.7	1.0	V
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =15V, Frequency=1.0MHz	-	260	-	pF
C <sub>oss</sub>	Output Capacitance		-	38	-	
C <sub>riss</sub>	Reverse transfer capacitance		-	22	-	
t <sub>d(ON)</sub>	Turn-on delay Time	V <sub>GS</sub> =10V, V <sub>DS</sub> =15V R <sub>G</sub> =3Ω, R <sub>L</sub> =3.75Ω,	-	4	-	nS
t <sub>r</sub>	Turn-on rise Time		-	2	-	
t <sub>d(OFF)</sub>	Turn-off delay Time		-	20	-	
t <sub>f</sub>	Turn-off rise Time		-	3	-	
<b>Gate Charge Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15V, V <sub>GS</sub> =10V, I <sub>DS</sub> =4A	-	10	19	nC
Q <sub>gs</sub>	Gate-Source Charge		-	1.1	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	1.8	-	

**TYPICAL CHARACTERISTICS (25 °C Unless Note)**

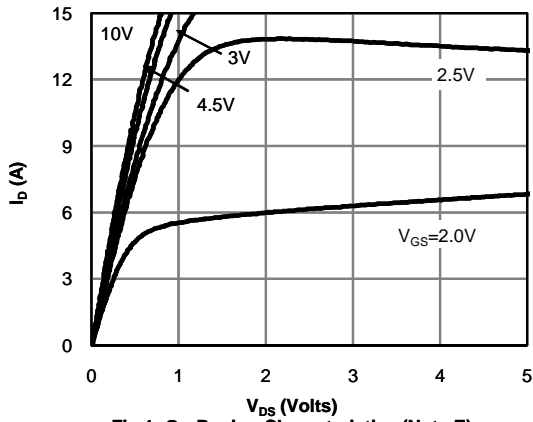


Fig 1: On-Region Characteristics (Note E)

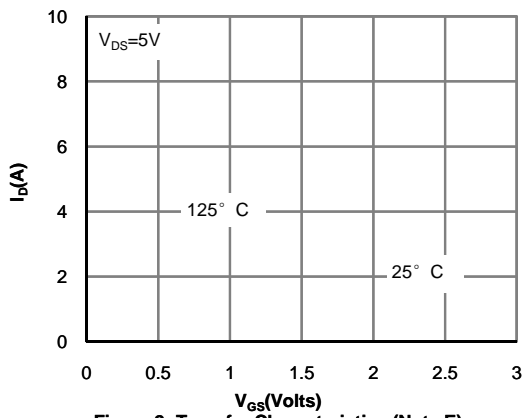


Figure 2: Transfer Characteristics (Note E)

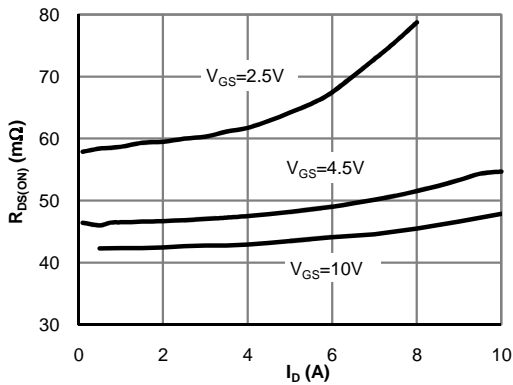


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

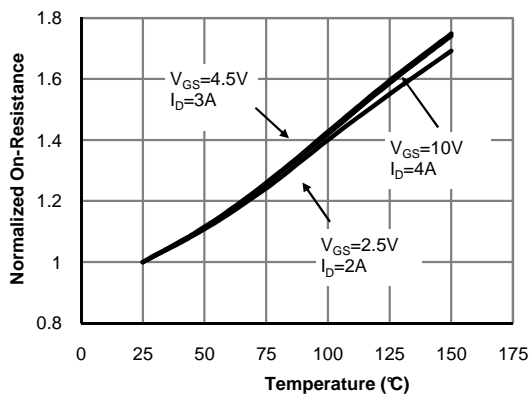


Figure 4: On-Resistance vs. Junction Temperature (Note E)

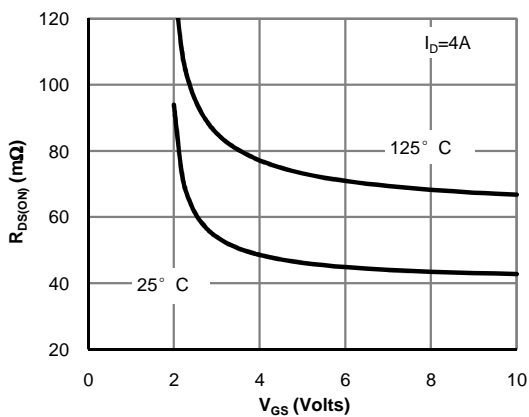


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

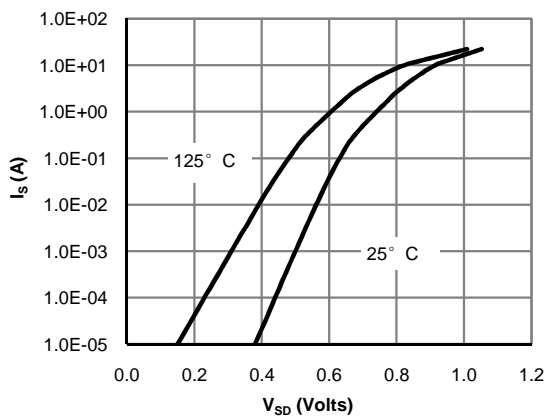


Figure 6: Body-Diode Characteristics (Note E)

**TYPICAL CHARACTERISTICS (continuous)**

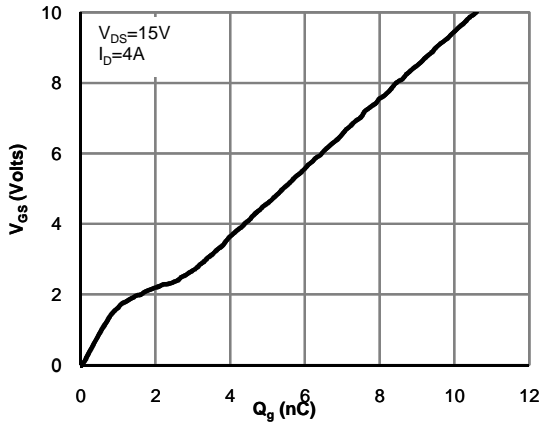


Figure 7: Gate-Charge Characteristics

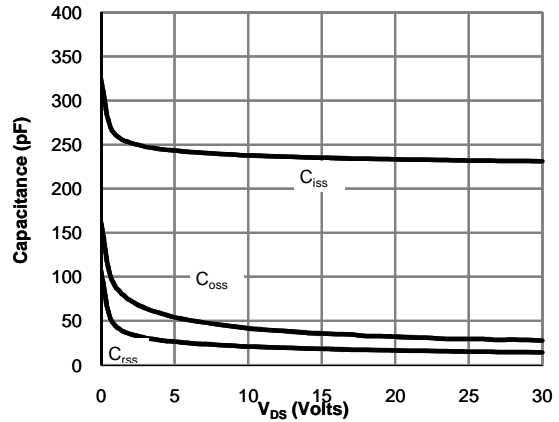


Figure 8: Capacitance Characteristics

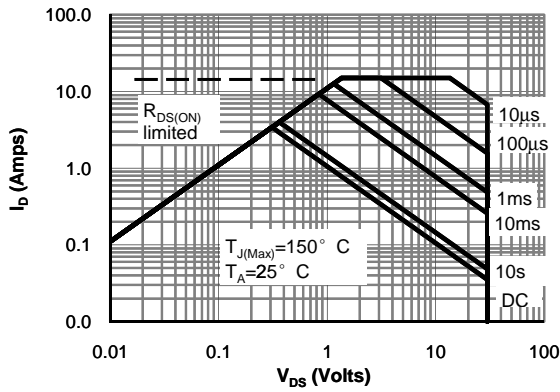


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

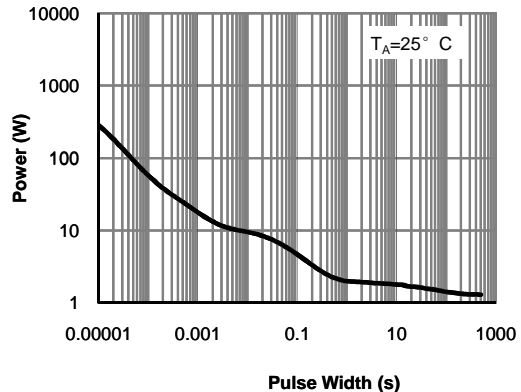


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

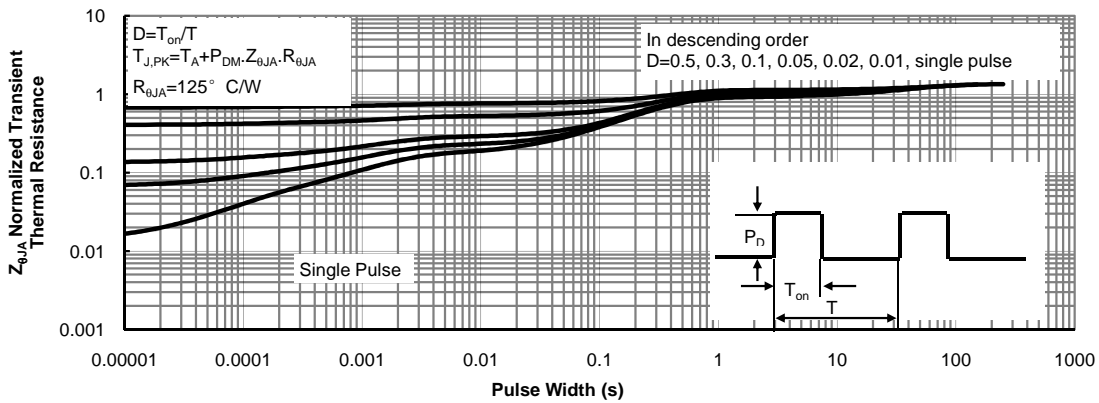
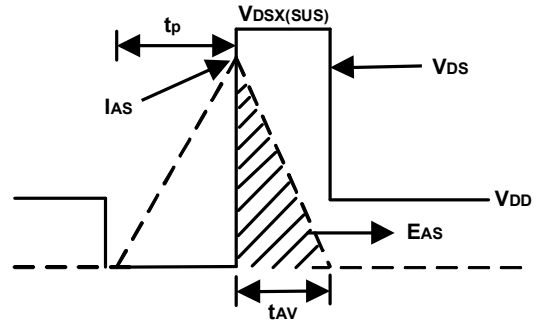
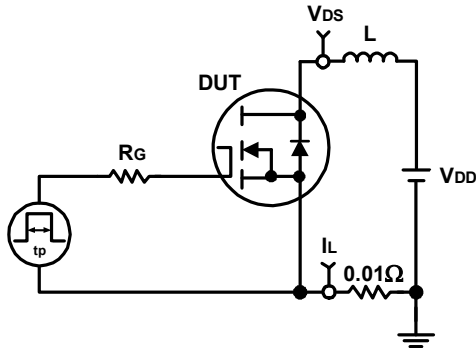
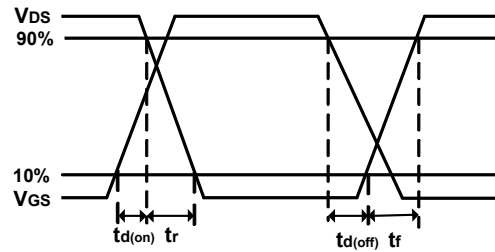
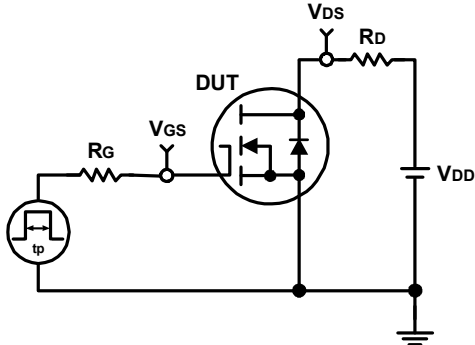


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

### Avalanche Test Circuit and Waveforms

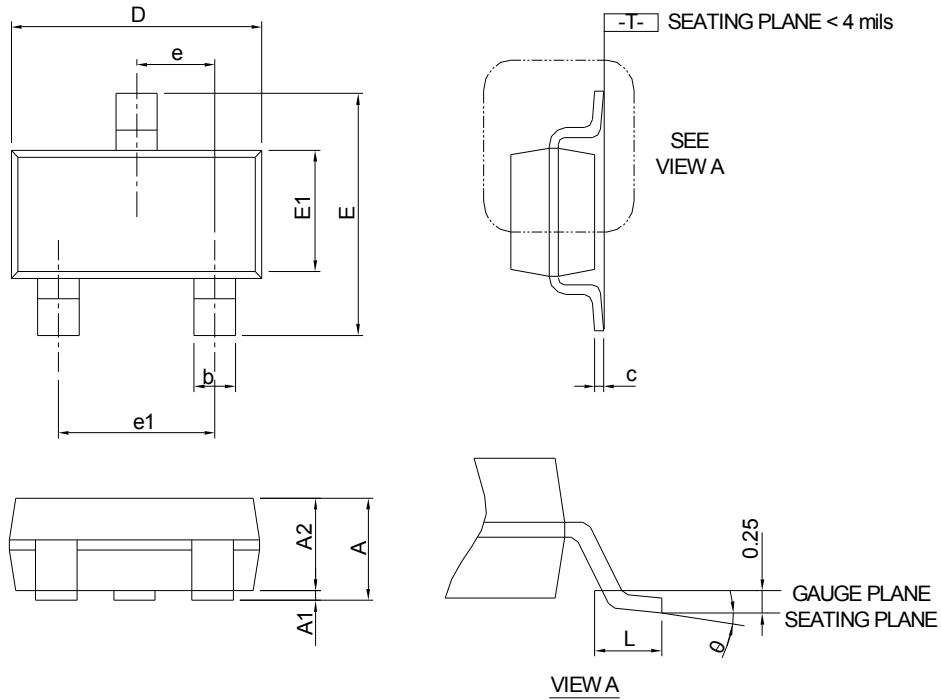


### Switching Time Test Circuit and Waveforms



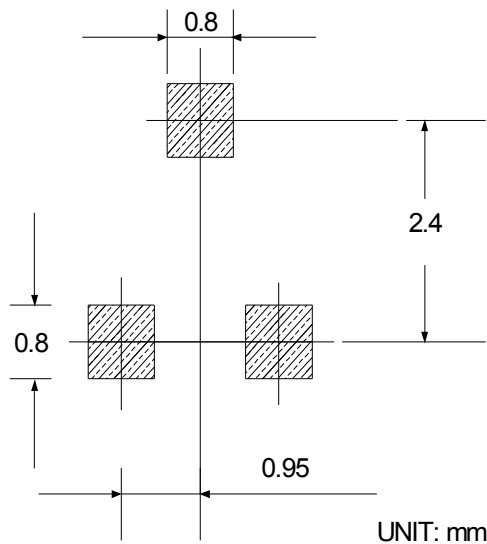
**Package Information**

SOT23-3L



DIMENSIONS	SOT 23-3L			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A		1.20		0.047
A1	0.00	0.08	0.000	0.003
A2	0.90	1.12	0.035	0.044
b	0.30	0.50	0.012	0.020
c	0.08	0.22	0.003	0.009
D	2.70	3.10	0.106	0.122
E	2.60	3.00	0.102	0.118
E1	1.40	1.80	0.055	0.071
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°

**RECOMMENDED LAND PATTERN**



Note : Dimension D and E1 do not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 10 mil per side.

## Attention

- Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress rating only and functional device operation is not implied. YiDeng Wei Semiconductor assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all YiDeng Wei Semiconductor products described or contained herein.
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