YD3413

## P-Channel Enhancement Mode MOSFET

Features

- -20V / -3A
- $R_{DS(ON)}$=56mΩ (typ) @VGS=-4.5V
  $R_{DS(ON)}$=82mΩ (typ) @VGS=-2.5V
- 100% UIS & RG Tested
- Reliableand Rugged
- Lead Freeand Green Devices Available
  (RoHS Compliant)
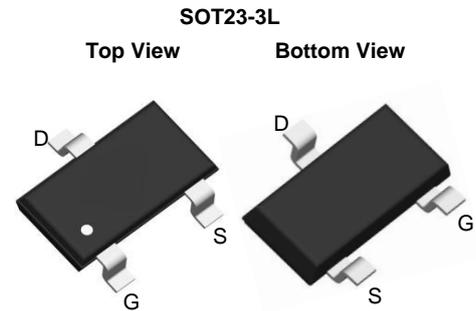
Applications

- Power Management for Industrial DC/DC Converters

Marking

Marking	AD****

SOT23-3L

Top View   Bottom View

P Channel
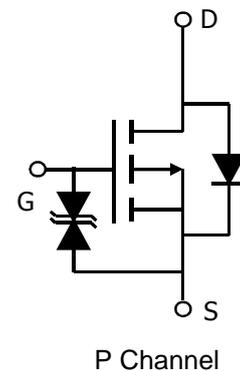
ABSOLUTE MAXIMUM RATINGS (T_A = 25℃ Unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		-20	V
V_{GSS}	Gate-Source Voltage		±12	V
I_D	Continuous Drain Current (TJ=150℃)	V_{GS}-4.5V	-3.0	A
I_{DM}	Pulsed Drain Current		-15	A
I_S	Continuous Source Current (Diode Conduction)		-1.6	A
P_D	Power Dissipation	T_A=25℃	1.4	W
		T_A=70℃	0.9	
T_J	Operation Junction Temperature		150	℃
T_{STG}	Storage Temperature Range		-55~+150	℃
$R_{θJA}$	Thermal Resistance Junction to Ambient		120	℃/W

ELECTRICAL CHARACTERISTICS$(T_A=25℃$ Unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Parameters						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250uA$	-20			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=-250uA$	-0.4		-1	V
I_{GSS}	Gate Leakage Current	$V_{DS}=0V$, $V_{GS}=±12V$			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-20V$, $V_{GS}=0$			-1	uA
		$V_{DS}=-20V$, $V_{GS}=0$ $T_J=55℃$			-10	
$R_{DS(ON)}$	Drain-Source On-Resistance	$V_{GS}=-4.5V$, $I_D=-3.0A$		56	80	mΩ
		$V_{GS}=-2.5V$, $I_D=-2.6A$		82	100	
		$V_{GS}=-1.8V$, $I_D=-1.0A$			160	
Gfs	Forward Transconductance	$V_{DS}=-5V$, $I_D=-2.8A$		6.5		S
Source-Drain Diode						
V_{SD}	Diode Forward Voltage	$I_S=-1.6A$, $V_{GS}=0V$		-0.7	-1.2	V
Dynamic Parameters						
Q_g	Total Gate Charge	$V_{DS}=-10V$		7	10	nC
Q_{gs}	Gate-Source Charge	$V_{GS}=-4.5V$		1.8		
Q_{gd}	Gate-Drain Charge	$I_D=-3.2A$		2		
C_{iss}	Input Capacitance	$V_{DS}=-10V$		415		pF
C_{oss}	Output Capacitance	$V_{GS}=0V$		223		
C_{rss}	Reverse Transfer Capacitance	$f=1MHz$		87		
$T_{d(on)}$	Turn-On Time	$V_{DS}=-10V$ $R_L=10Ω$		13	25	nS
T_r				36	60	
$T_{d(off)}$	Turn-Off Time	$I_D=-1A$ $V_{GEN}=-4.5V$ $R_G=6Ω$		42	70	
T_f				34	60	

# TYPICAL CHARACTERISTICS (25℃ Unless Note)
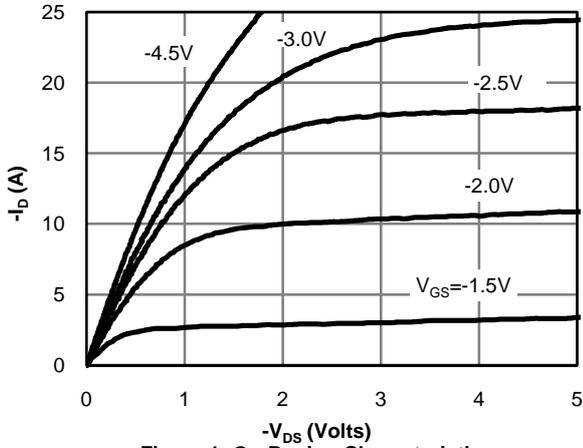
Figure 1: On-Region Characteristics
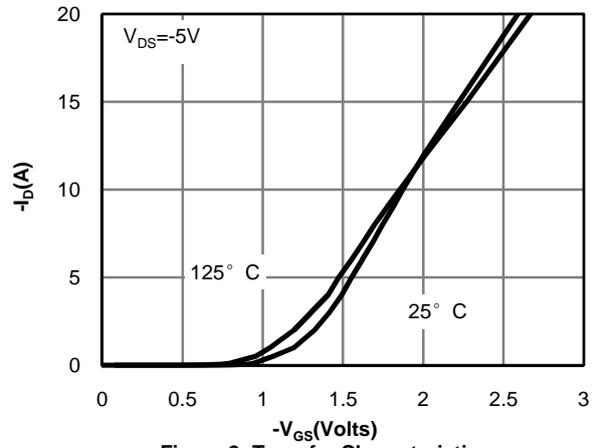
Figure 2: Transfer Characteristics
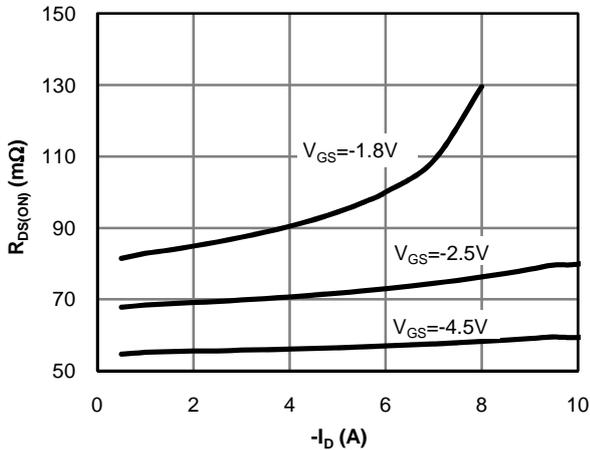
Figure 3: On-Resistance vs. Drain Current and Gate Voltage
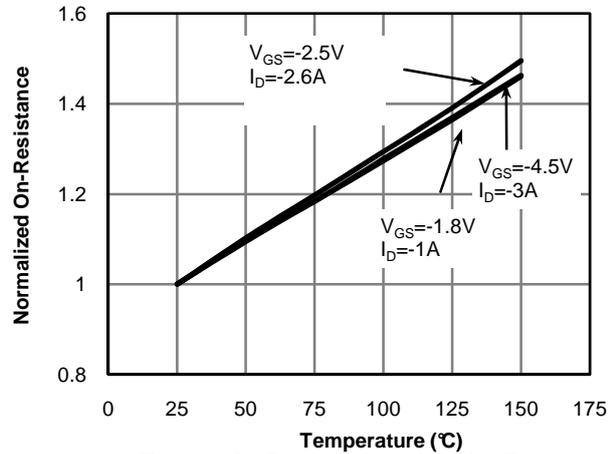
Figure 4: On-Resistance vs. Junction Temperature
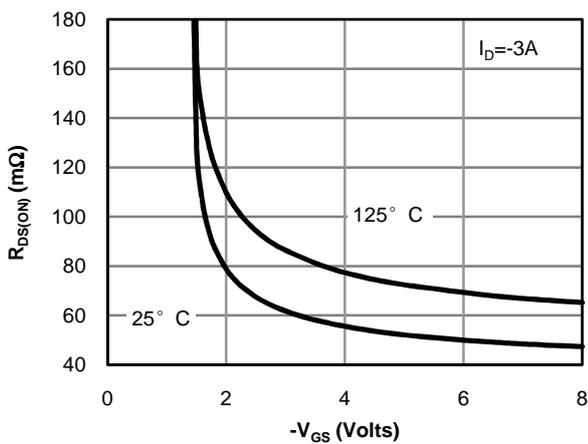
Figure 5: On-Resistance vs. Gate-Source Voltage
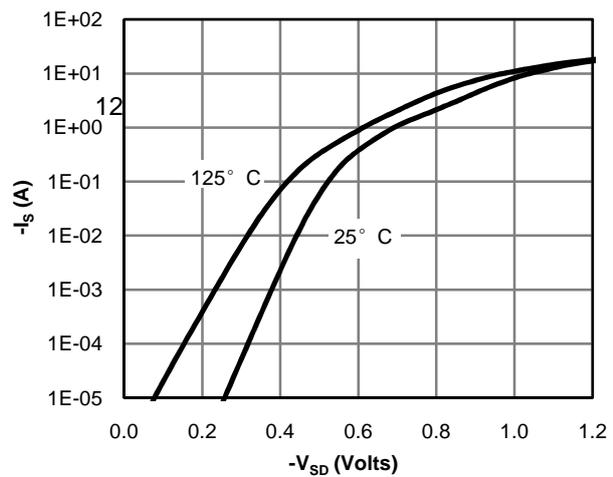
Figure 6: Body-Diode Characteristics

TYPICAL CHARACTERISTICS (continuous)
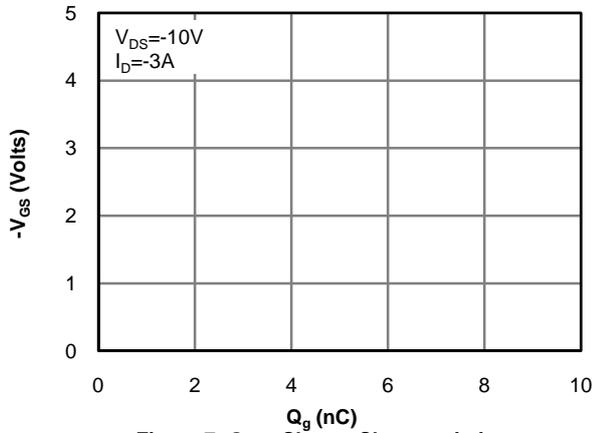

Figure 7: Gate-Charge Characteristics

V_{DS}=-10V
I_D=-3A
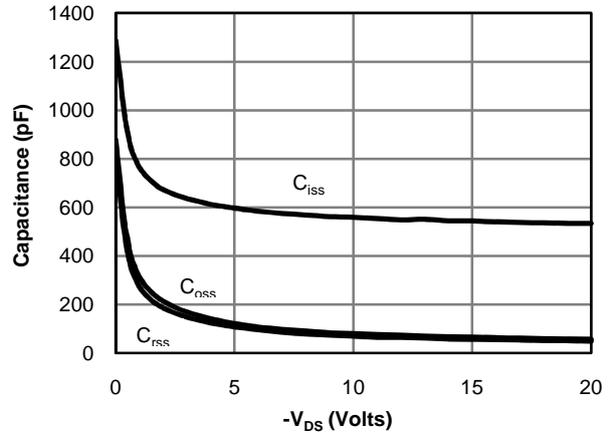
Figure 8: Capacitance Characteristics

C_{iss}
C_{oss}
C_{rss}
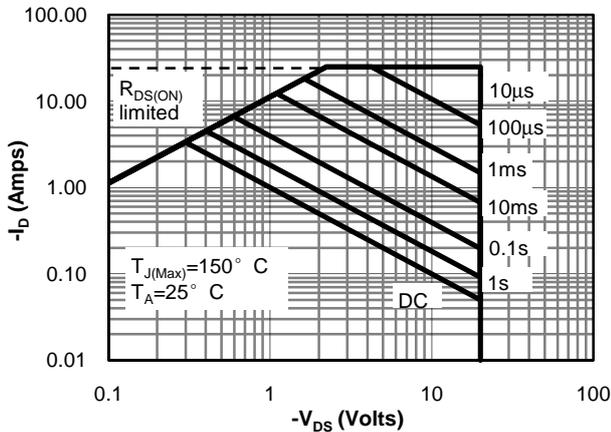
Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

$R_{DS(ON)}$ limited

10μs
100μs
1ms
10ms
0.1s
1s
DC

$T_{J(Max)}$=150°C
T_A=25°C
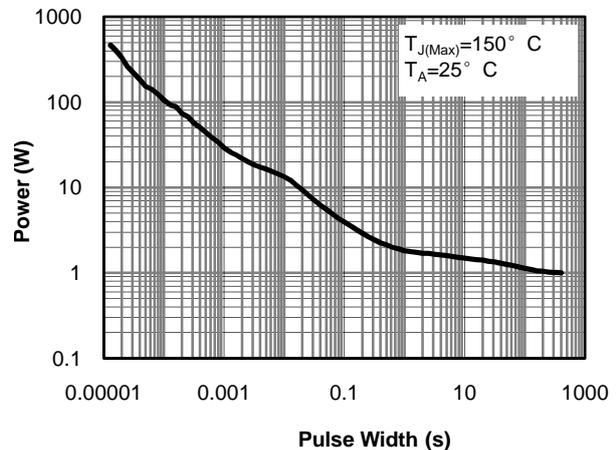
Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

$T_{J(Max)}$=150°C
T_A=25°C
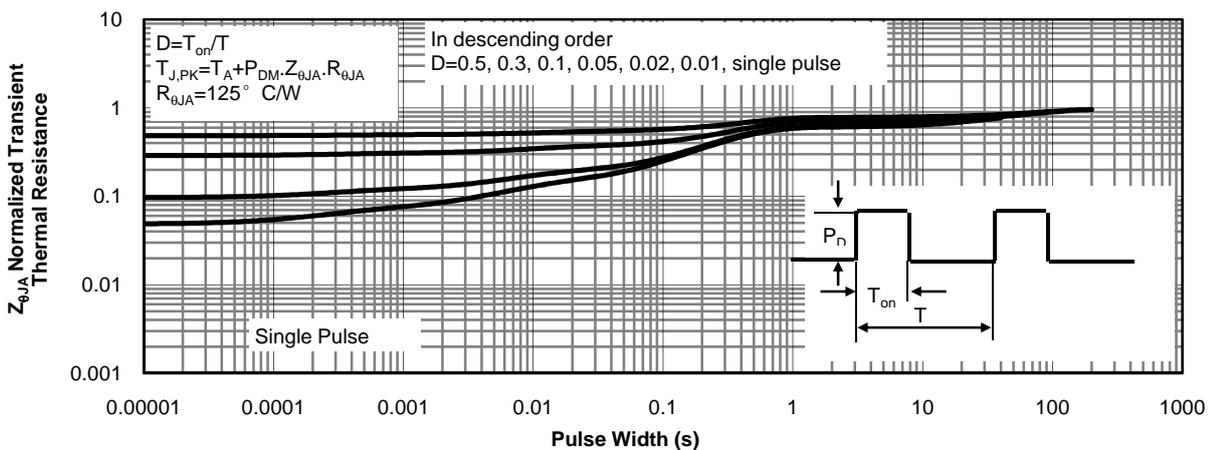
Figure 11: Normalized Maximum Transient Thermal Impedance (Note E)

$D=T_{on}/T$
$T_{J,PK}=T_A+P_{DM}\cdot Z_{\theta JA}\cdot R_{\theta JA}$
$R_{\theta JA}$=125°C/W

In descending order
D=0.5, 0.3, 0.1, 0.05, 0.02, 0.01, single pulse

P_D
T_{on}
T

Single Pulse

SOT23-3L PACKAGE OUTLINE DIMENSIONS
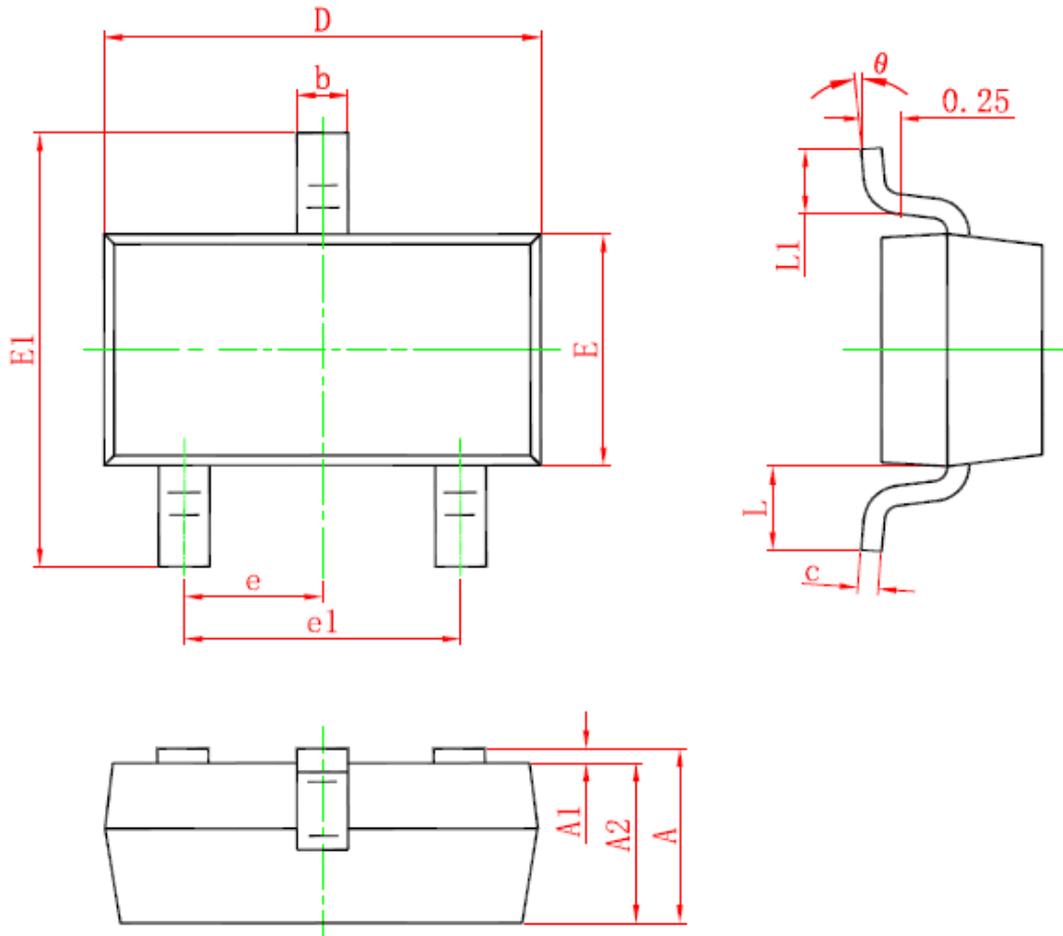
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

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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