

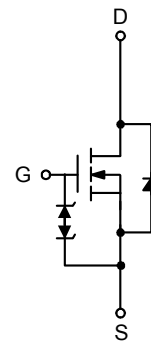
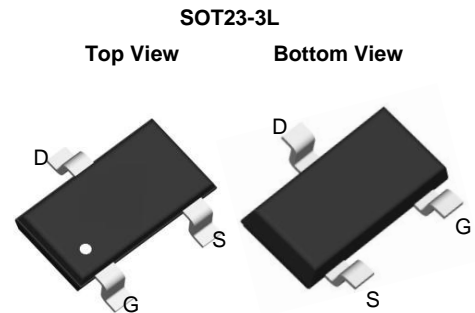
N-Channel Enhancement Mode MOSFET

Features

- 20V / 6A
 - $R_{DS(ON)} = 15m\Omega$ (Typ.) @ $V_{GS} = 10V$
 - $R_{DS(ON)} = 16m\Omega$ (Typ.) @ $V_{GS} = 4.5V$
 - $R_{DS(ON)} = 18m\Omega$ (Typ.) @ $V_{GS} = 2.5V$
 - $R_{DS(ON)} = 26m\Omega$ (Typ.) @ $V_{GS} = 1.8V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- ESD Protection

Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems



N-Channel MOSFET

Marking

Marking	AG****
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Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

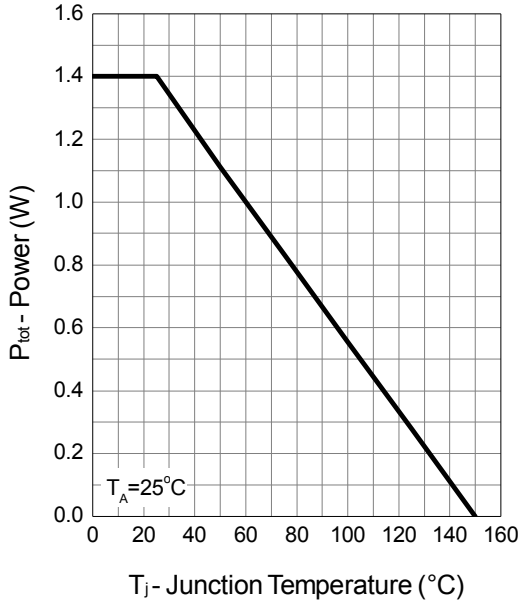
Symbol	Parameter	Rating	Unit	
V_{DSS}	Drain-Source Voltage	20	V	
V_{GSS}	Gate-Source Voltage	± 12		
I_D^*	Continuous Drain Current	$T_A = 25^\circ C$	6	A
		$T_A = 70^\circ C$	4.8	
I_{DM}^*	300 μs Pulsed Drain Current	$V_{GS} = 10V$	20	A
I_S^*	Diode Continuous Forward Current	1	A	
T_J	Maximum Junction Temperature	150	$^\circ C$	
T_{STG}	Storage Temperature Range	-55 to 150		
P_D^*	Maximum Power Dissipation	$T_A = 25^\circ C$	1.4	W
		$T_A = 70^\circ C$	0.89	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	$t \leq 10s$	90	$^\circ C/W$
		Steady State	110	

Electrical Characteristics (T_A = 25°C unless otherwise noted)

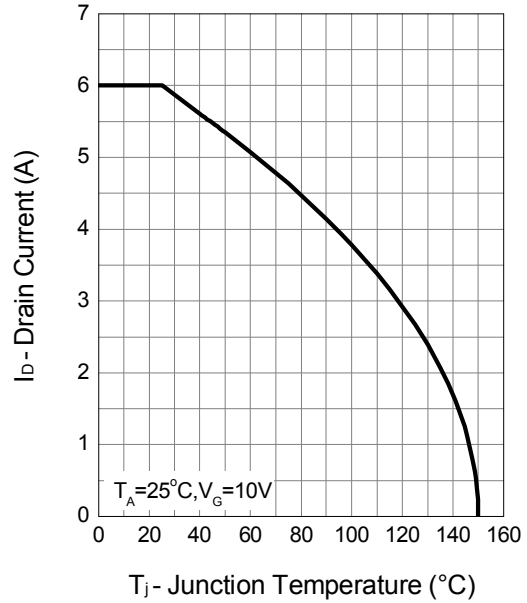
Symbol	Parameter	Test Conditions	XP3416			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	0.5	0.75	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±10V, V _{DS} =0V	-	-	±10	μA
R _{DS(ON)} ^a	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =6A	-	15	20	mΩ
		V _{GS} =4.5V, I _{DS} =6A	-	16	22	
		V _{GS} =2.5V, I _{DS} =2A	-	18	26	
		V _{GS} =1.8V, I _{DS} =1A	-	26	34	
V _{SD} ^a	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.7	1.3	V
Gate Charge Characteristics^b						
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _{DS} =6A	-	8.6	-	nC
Q _{gs}	Gate-Source Charge		-	0.7	-	
Q _{gd}	Gate-Drain Charge		-	3.2	-	
Dynamic Characteristics^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	5	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Frequency=1.0MHz	-	460	-	pF
C _{oss}	Output Capacitance		-	115	-	
C _{rss}	Reverse Transfer Capacitance		-	105	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =10V, R _L =10Ω, I _{DS} =1A, V _{GEN} =4.5V, R _G =6Ω	-	4	-	ns
t _r	Turn-on Rise Time		-	14	-	
t _{d(OFF)}	Turn-off Delay Time		-	26	-	
t _f	Turn-off Fall Time		-	7.6	-	
t _{rr}	Reverse Recovery Time	I _{SD} =6A, dI _{SD} /dt=100A/μs	-	18	-	ns
Q _{rr}	Reverse Recovery Charge		-	5.5	-	nC

Typical Operating Characteristics

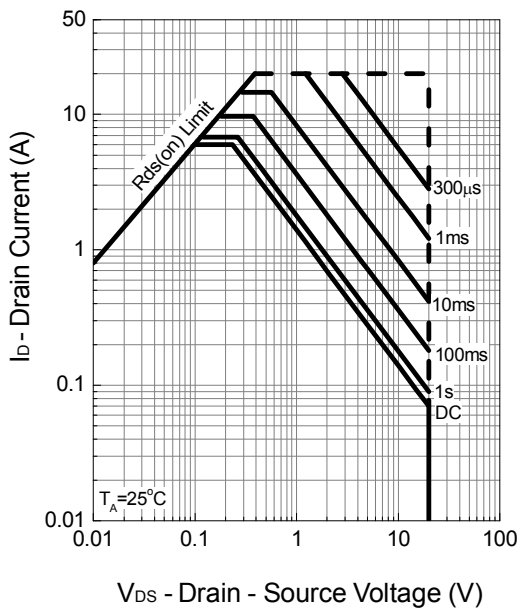
Power Dissipation



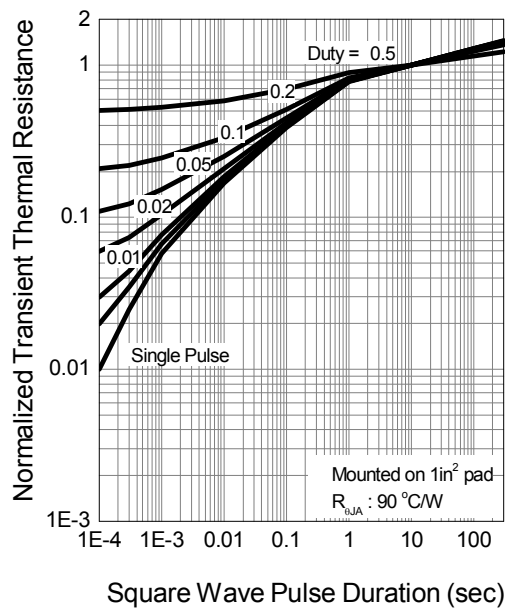
Drain Current



Safe Operation Area

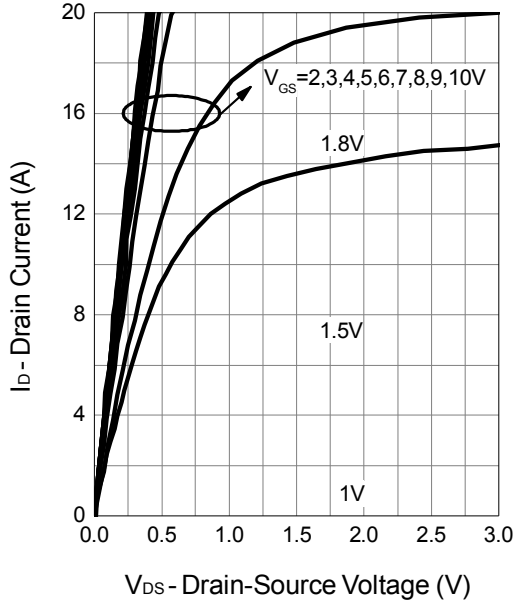


Thermal Transient Impedance

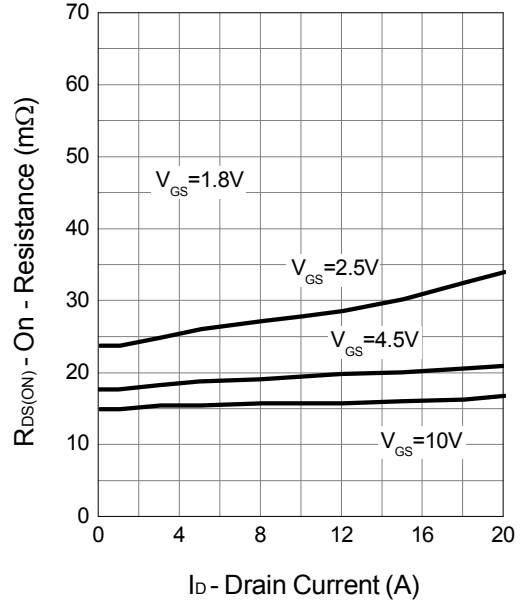


Typical Operating Characteristics (Cont.)

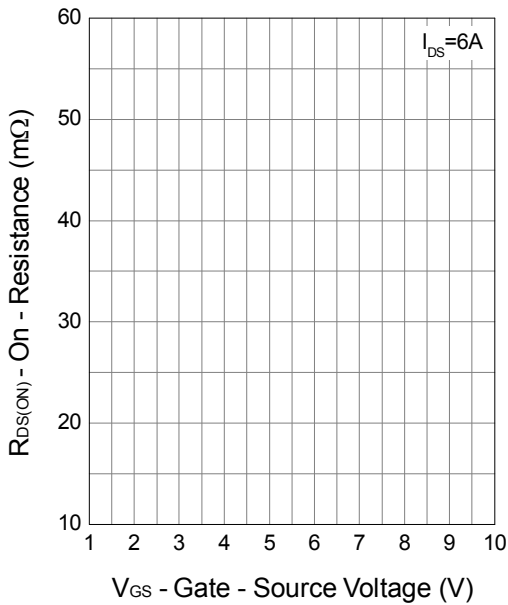
Output Characteristics



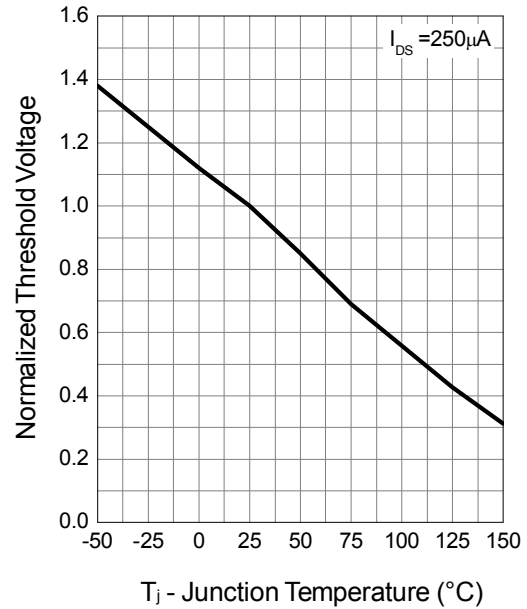
Drain-Source On Resistance



Gate-Source On Resistance

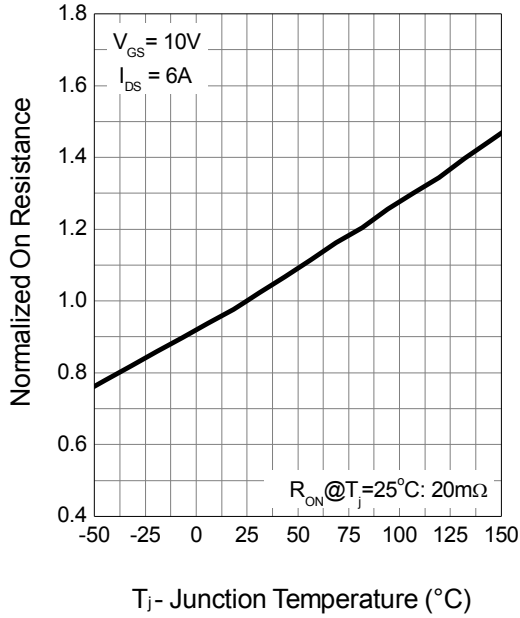


Gate Threshold Voltage

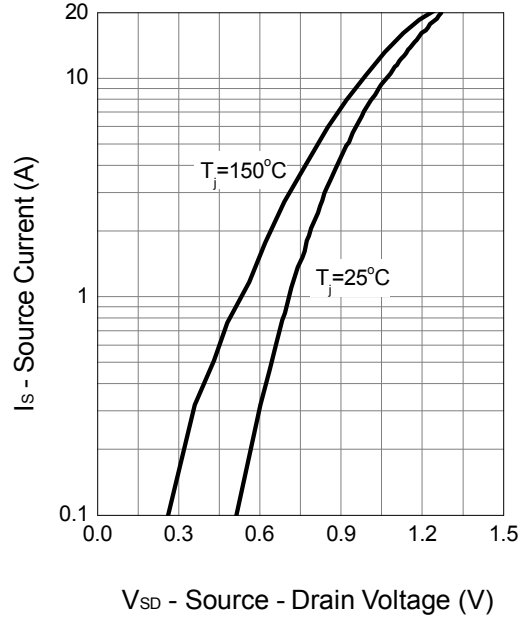


Typical Operating Characteristics (Cont.)

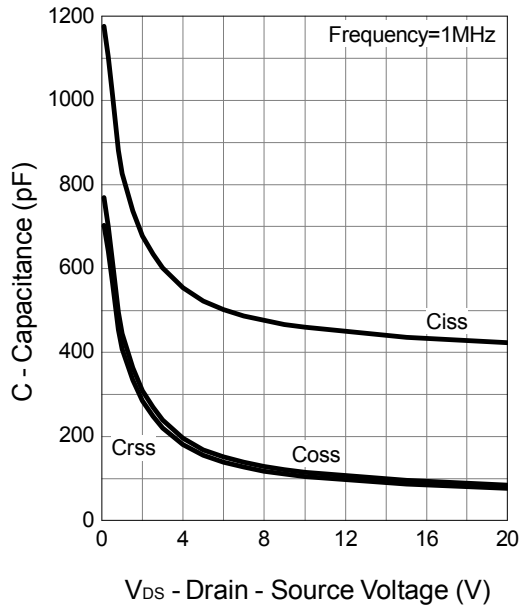
Drain-Source On Resistance



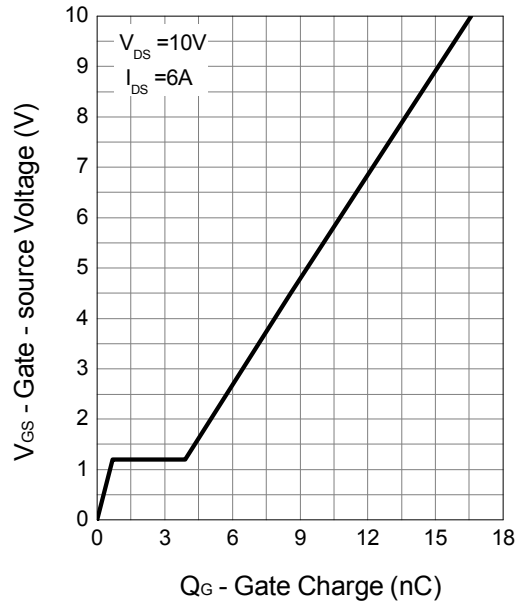
Source-Drain Diode Forward



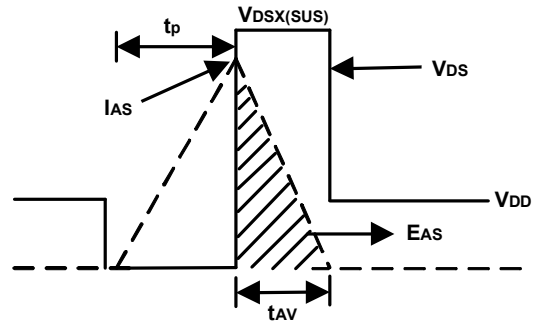
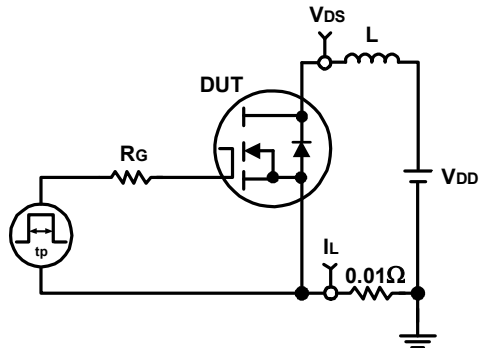
Capacitance



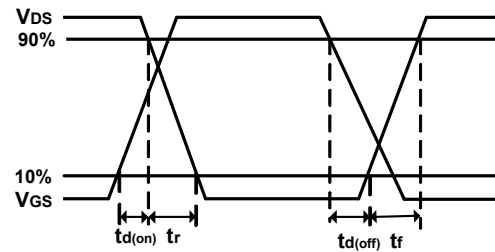
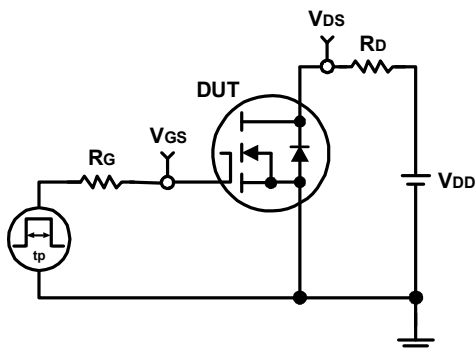
Gate Charge



Avalanche Test Circuit and Waveforms

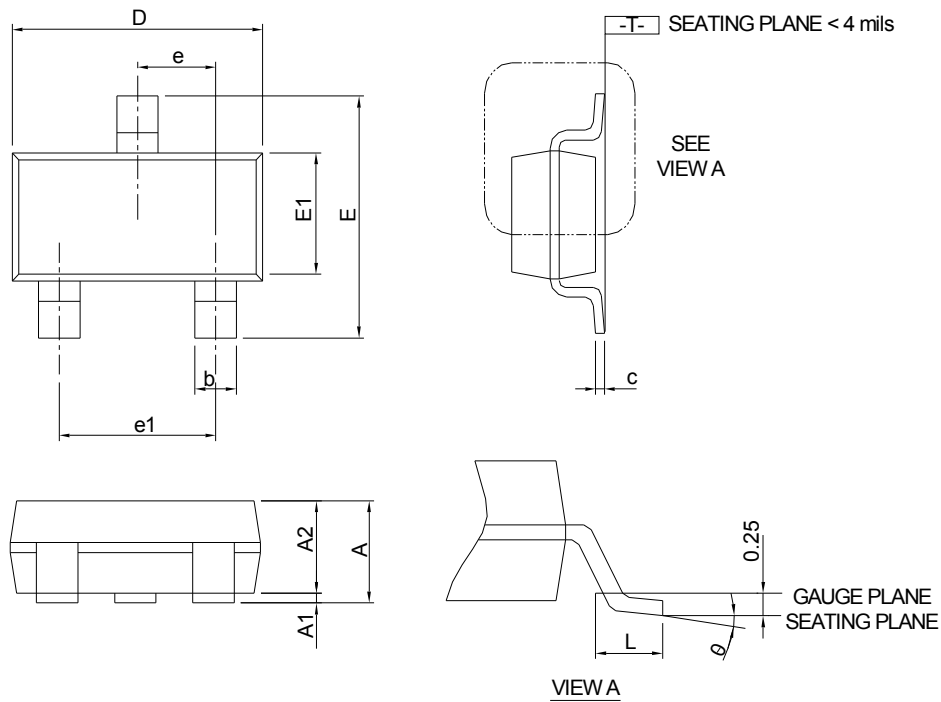


Switching Time Test Circuit and Waveforms



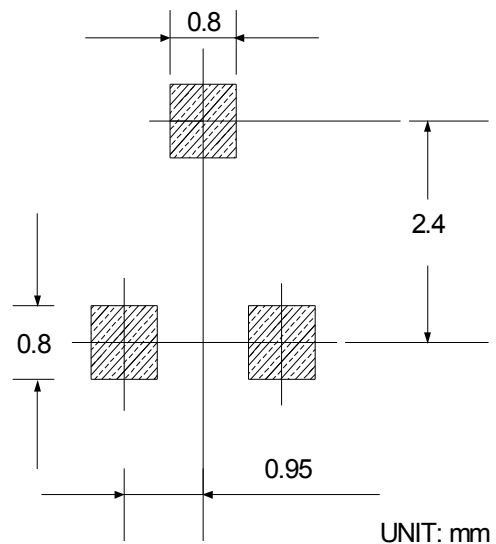
Package Information

SOT23-3L



SYMBOL	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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