

N-Channel Enhancement Mode MOSFET

Features

- 30V/4.0A,
 $R_{DS(ON)}=36m\Omega(Typ.) @V_{GS}=10V$
 $R_{DS(ON)}=49m\Omega(Typ.) @V_{GS}=4.5V$
- Reliable and Rugged
- Lead Free and Green Devices
 Available(RoHSCompliant)

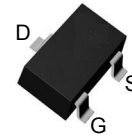
Applications

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

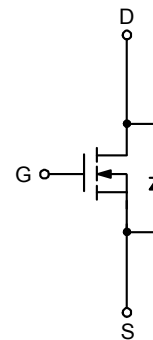
Marking

Marking	A6****
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Pin Description



Top View of SOT23-3L



N-Channel MOSFET

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

Symbol	Parameter	Rating	Unit	
V_{DSS}	Drain-Source Voltage	30	V	
V_{GSS}	Gate-Source Voltage	± 20		
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	4.0	A
		$T_A=70^\circ\text{C}$	3.7	
I_{DM}	300 μs Pulsed Drain Current	$V_{GS}=10V$	18	A
I_S	Diode Continuous Forward Current		1	A
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	1.4	W
		$T_A=70^\circ\text{C}$	0.9	
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{sec}$	90	$^\circ\text{C/W}$
		Steady state	140	

Note: *Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.

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

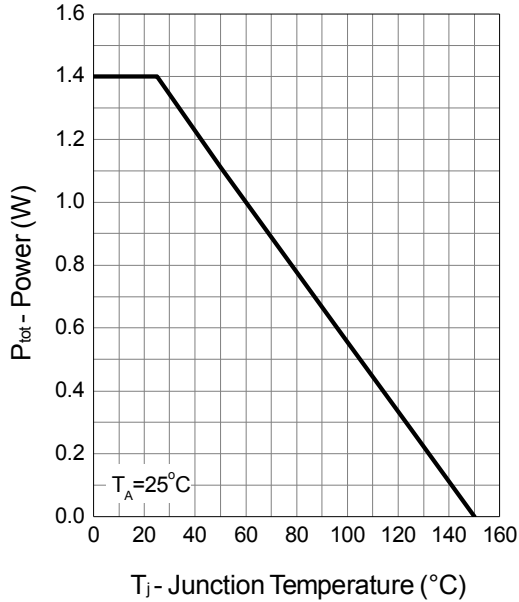
Symbol	Parameter	Test Conditions	XP3406			Unit	
			Min.	Typ.	Max.		
Static Characteristics							
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V	
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V	-	-	1	μA	
		T _J =85°C	-	-	30		
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.3	1.8	2.5	V	
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA	
R _{DS(ON)} ^a	Drain-Source On-State Resistance	V _{GS} =10V, I _{DS} =4A	-	36	50	mΩ	
		V _{GS} =4.5V, I _{DS} =3A	-	49	70		
Diode Characteristics							
V _{SD} ^a	Diode Forward Voltage	I _{SD} =1A, V _{GS} =0V	-	0.75	1.1	V	
t _{rr}	Reverse Recovery Time	I _{SD} =4A, dI _{SD} /dt=100A/μs	-	10	-	ns	
Q _{rr}	Reverse Recovery Charge		-	4	-	nC	
Dynamic Characteristics^b							
R _g	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	2.1	-	Ω	
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	240	-	pF	
C _{oss}	Output Capacitance		-	40	-		
C _{rss}	Reverse Transfer Capacitance		-	30	-		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	4.5	9	ns	
T _r	Turn-on Rise Time		-	11	21		
t _{d(OFF)}	Turn-off Delay Time		-	11	21		
T _f	Turn-off Fall Time		-	2.6	5		
Gate Charge Characteristics^b							
Q _g	Total Gate Charge	V _{DS} =15V, I _{DS} =4A	V _{GS} =4.5V,	-	3	-	nC
			V _{GS} =10V	-	6.2	-	
Q _{gs}	Gate-Source Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =4A	-	0.8	-		
Q _{gd}	Gate-Drain Charge		-	1.6	-		
Q _{gth}	Threshold Gate Charge		-	3.1	-		

Note a: Pulse test; pulse width≤300μs, duty cycle≤2%.

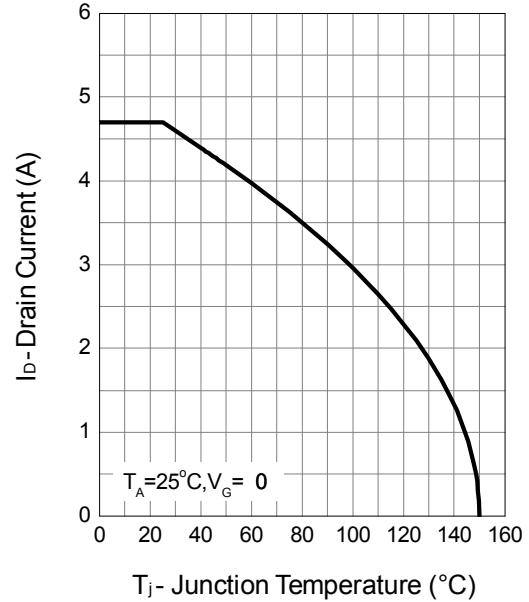
Note b: Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

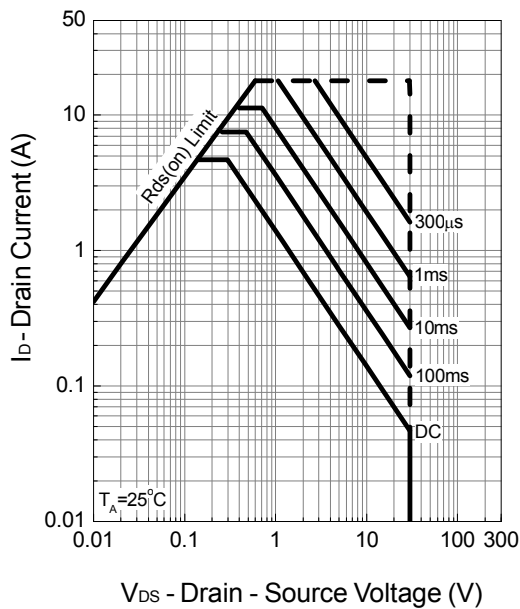
Power Dissipation



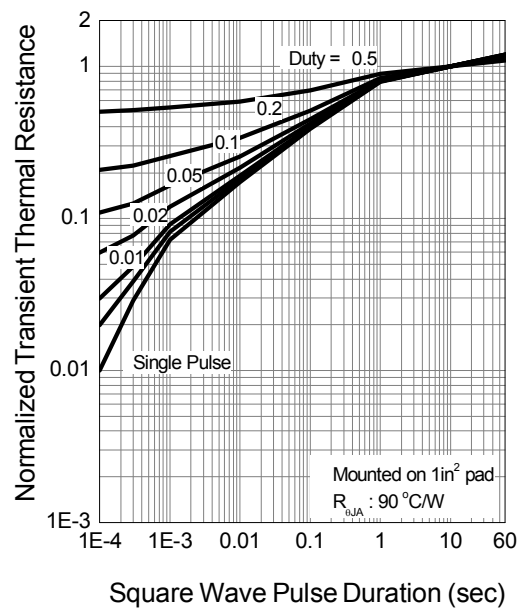
Drain Current



Safe Operation Area

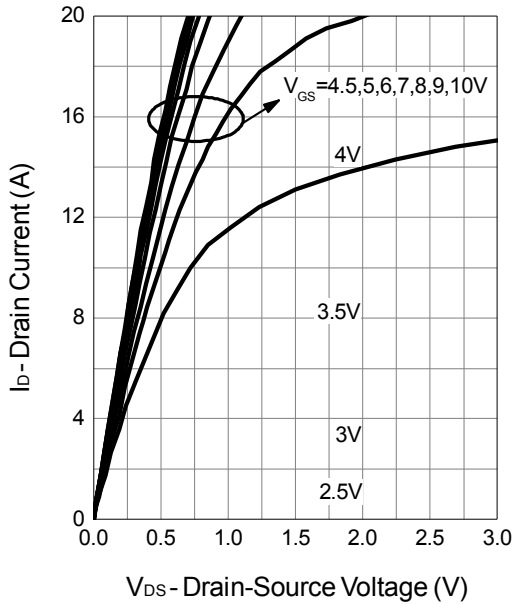


Thermal Transient Impedance

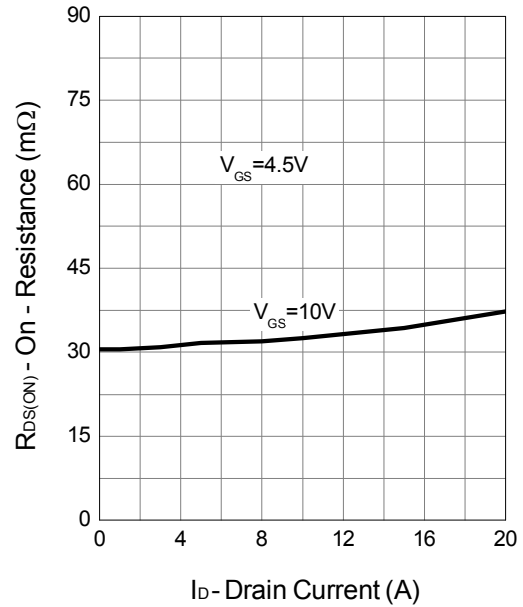


Typical Operating Characteristics (Cont.)

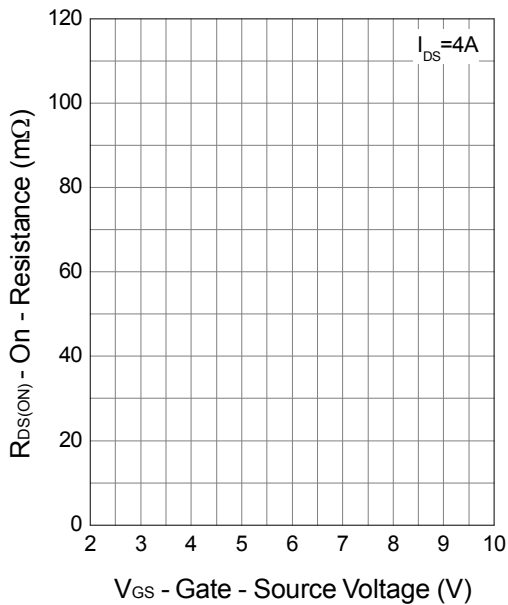
Output Characteristics



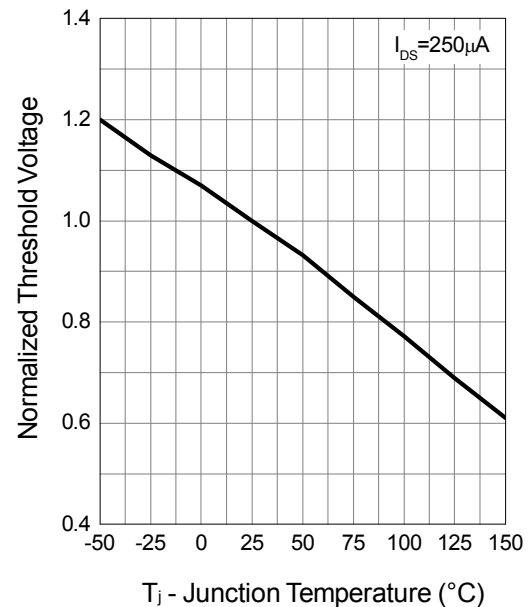
Drain-Source On Resistance



Gate-Source On Resistance

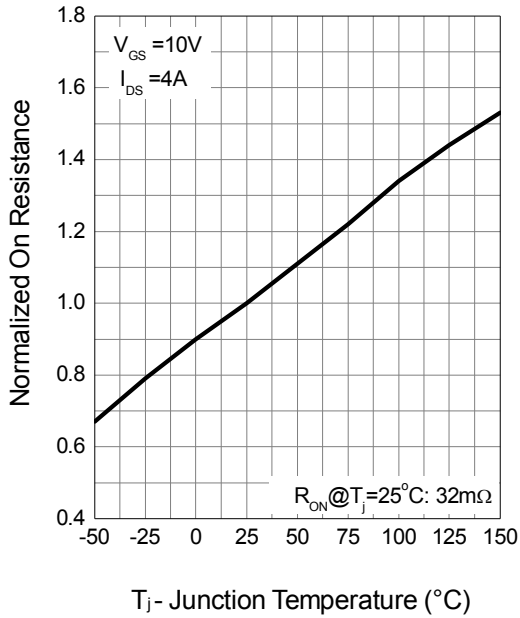


Gate Threshold Voltage

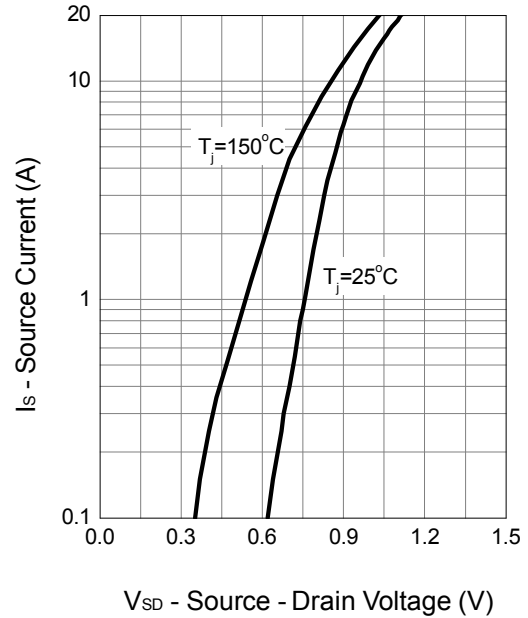


Typical Operating Characteristics (Cont.)

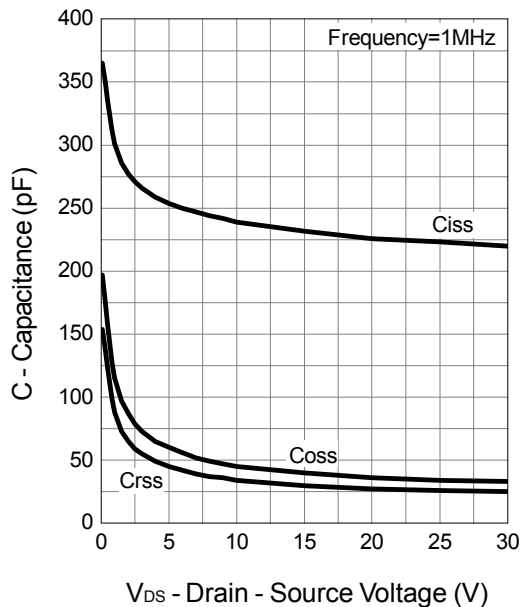
Drain-Source On Resistance



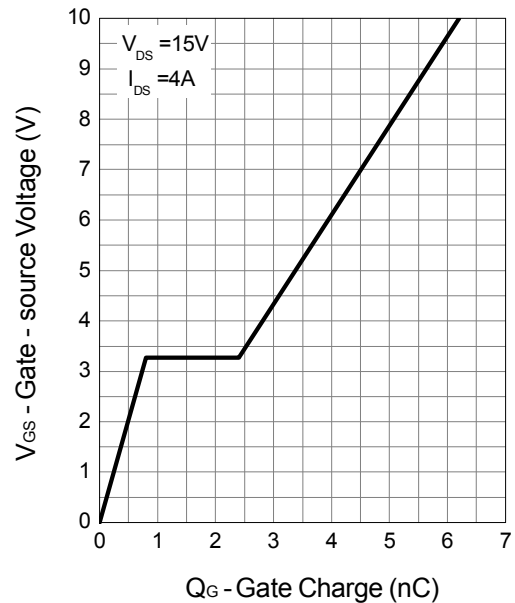
Source-Drain Diode Forward



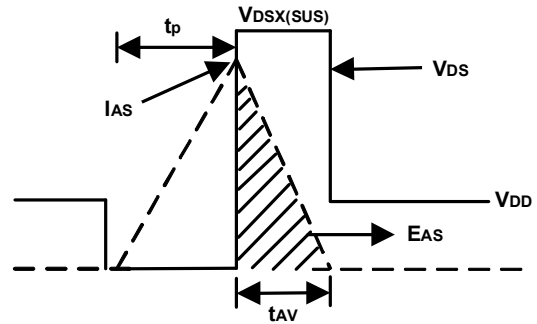
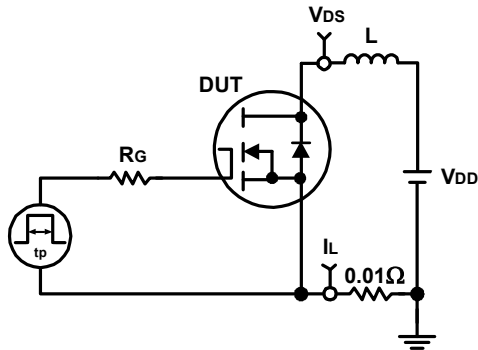
Capacitance



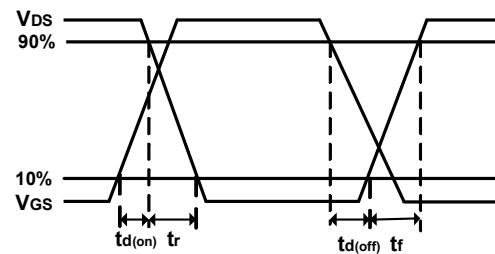
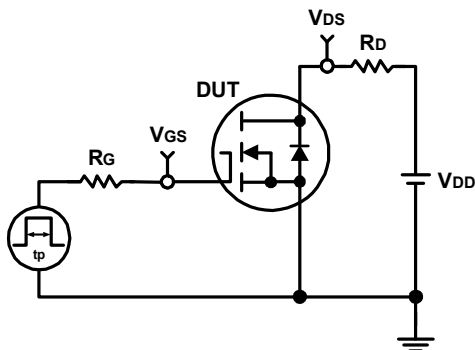
Gate Charge



Avalanche Test Circuit and Waveforms

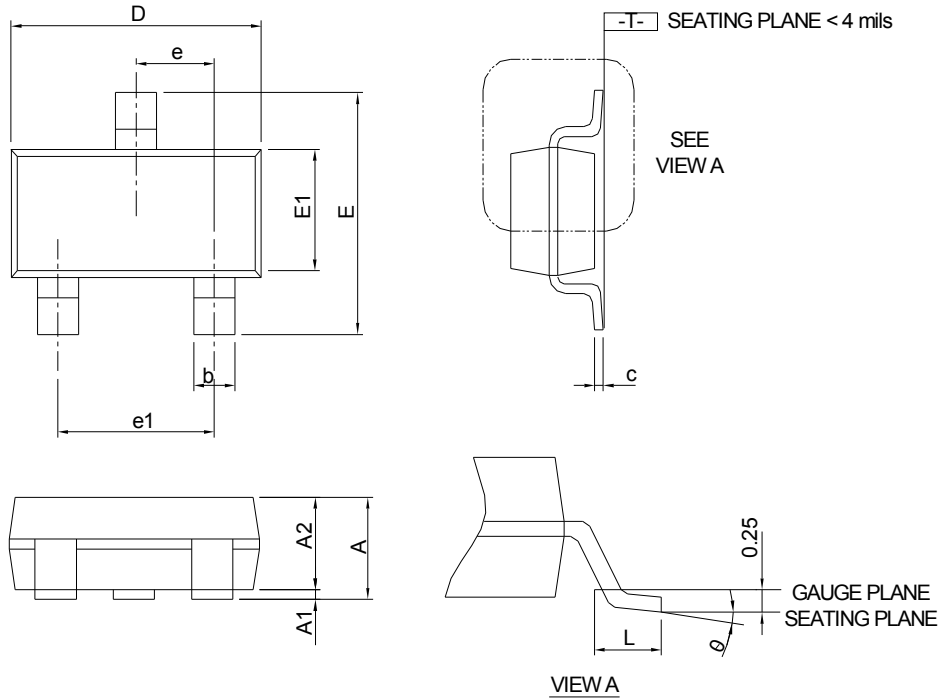


Switching Time Test Circuit and Waveforms



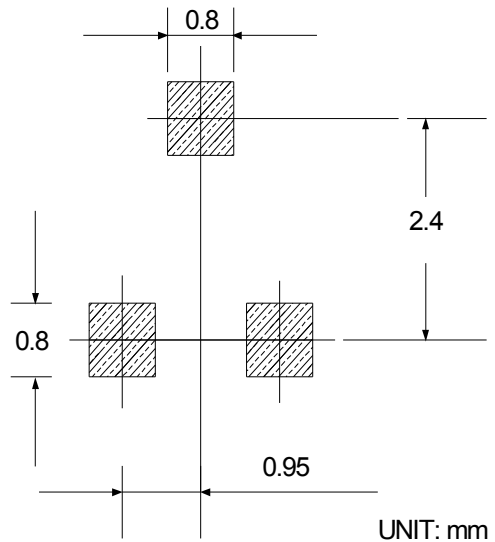
Package Information

SOT23-3L



DIMENSIONS	SOT-23-3			
	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.

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