
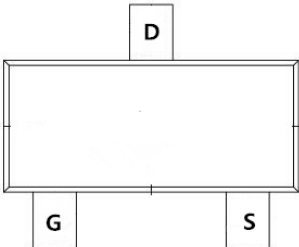


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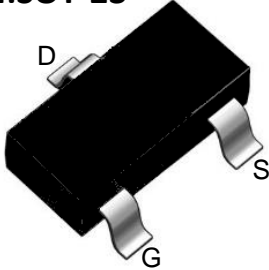
P-Channel Enhancement Mosfet

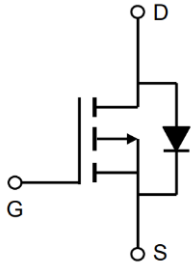
<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = -20V, I_D = -3.0A$</p> <p>$R_{DS(ON)} = 62 m\Omega (typ.) @ V_{GS} = -4.5V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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Marking: 2301 OR A1SHB

I:SOT-23





Absolute Maximum Ratings: ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Continuous Drain Current	-3.0	A
I_{DM}	Pulsed Drain Current ¹	-10	
P_D	Power Dissipation	1	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ¹	125	$^\circ C/W$

Electrical Characteristics: ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250 \mu A$	-20	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-20V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250 \mu A$	-0.4	-0.7	-1	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=-4.5V, I_D=-3A$	---	62	76	m Ω
		$V_{GS}=-2.5V, I_D=-3A$	---	78	98	
G_{FS}	Forward Transconductance	$V_{DS}=-5V, I_D=-2A$	---	8	---	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$	---	480	---	pF
C_{oss}	Output Capacitance		---	83	---	
C_{rss}	Reverse Transfer Capacitance		---	54	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10V, I_D=-1A,$ $R_L=2.8\Omega,$ $V_{GS}=-4.5V, R_G=6\Omega$	---	11	---	ns
t_r	Rise Time		---	52	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	17	---	ns
t_f	Fall Time		---	10	---	ns
Q_g	Total Gate Charge	$V_{GS}=-4.5V, V_{DS}=-10V,$ $I_D=-3$	---	4	---	nC
Q_{gs}	Gate-Source Charge		---	0.7	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	1.2	---	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage ¹	$V_{GS}=0V, I_S=-3A$	---	---	-1.2	V
I_{SD}	Source-Drain Current(Body Diode)		---	---	-3	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

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Figure1. Power Dissipation

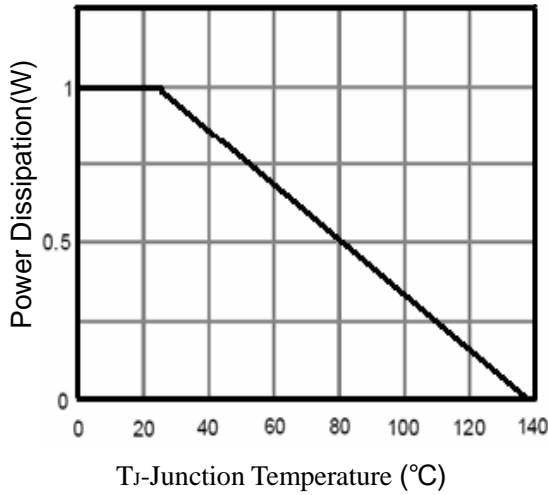


Figure2. Drain Current

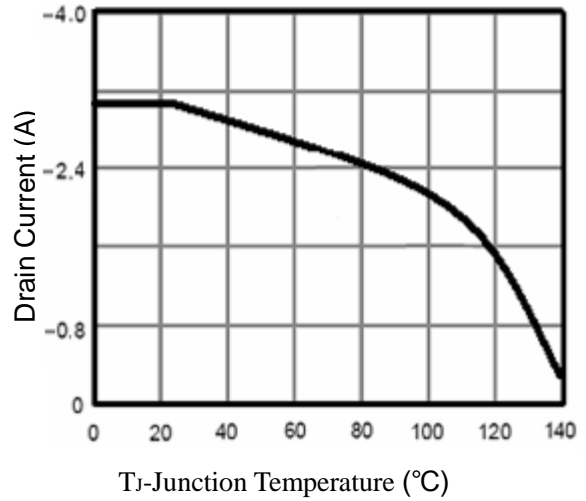


Figure3. Output Characteristics

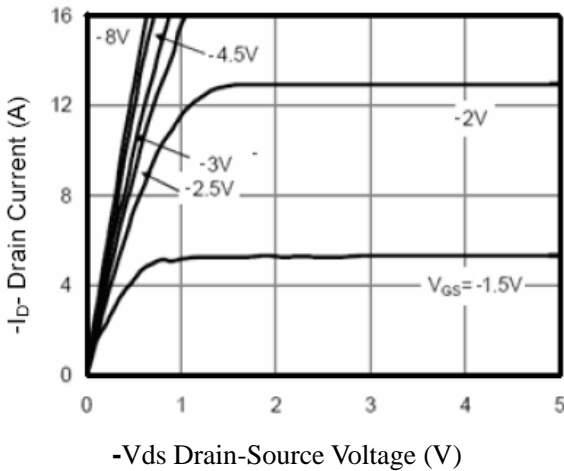


Figure4. Transfer Characteristics

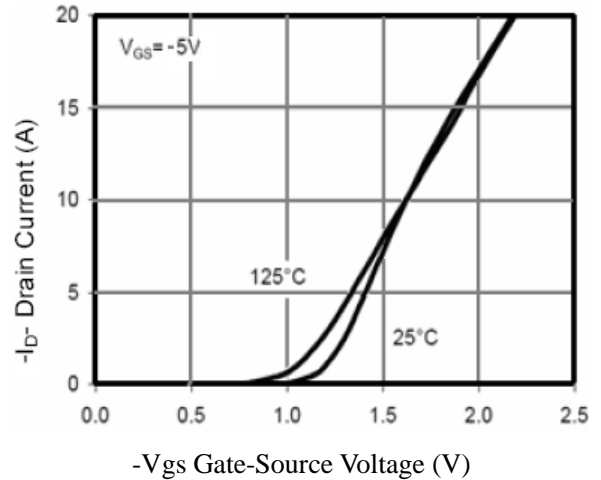


Figure5. Capacitance

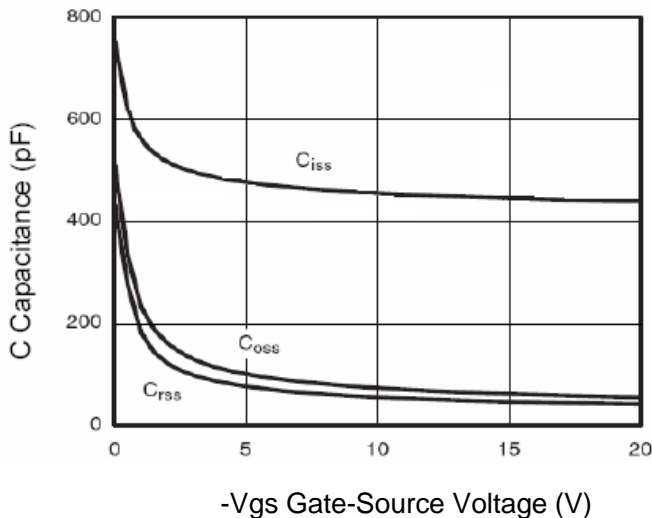
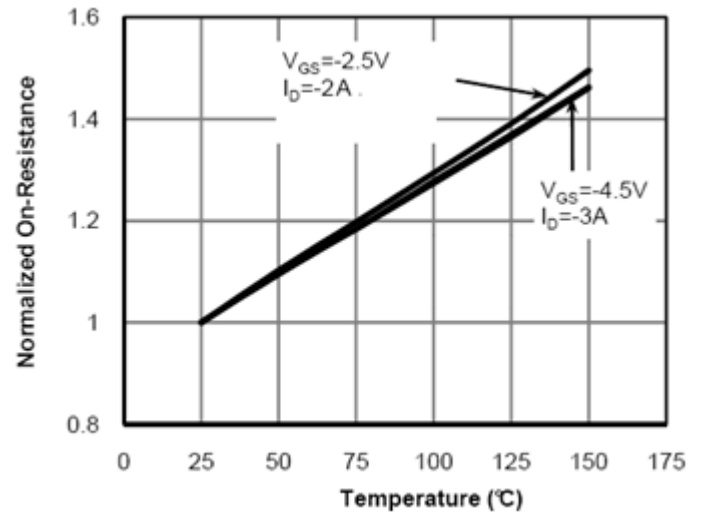


Figure6. R_{DS(ON)} vs Junction Temperature



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Figure7. Max BV_{DSS} vs Junction Temperature

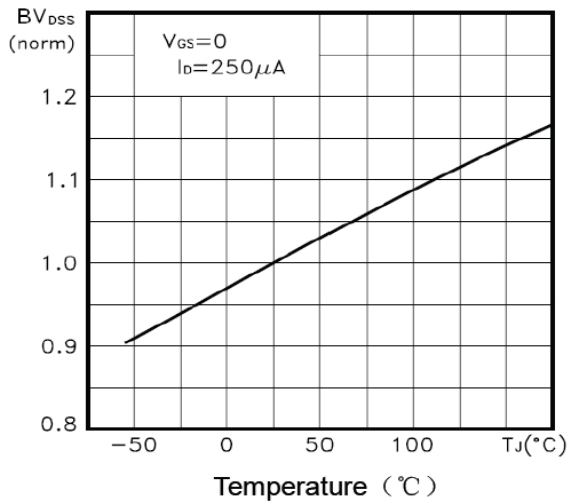


Figure8. $V_{GS(th)}$ vs Junction Temperature

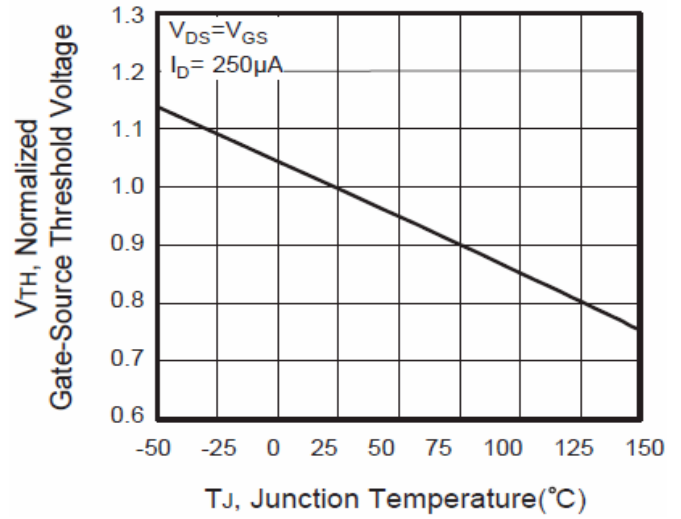


Figure9. Gate Charge Waveforms

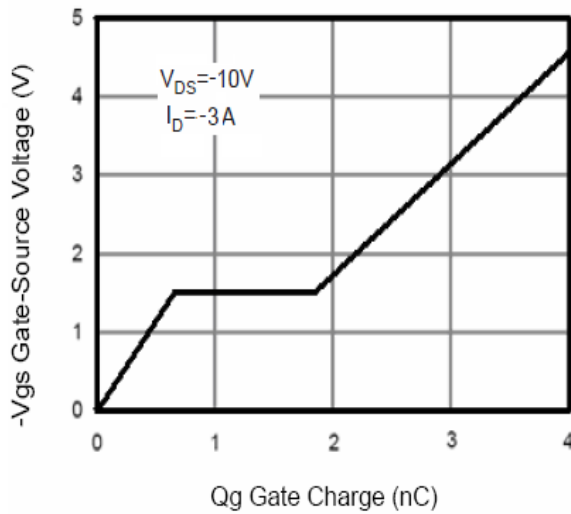


Figure10. Maximum Safe

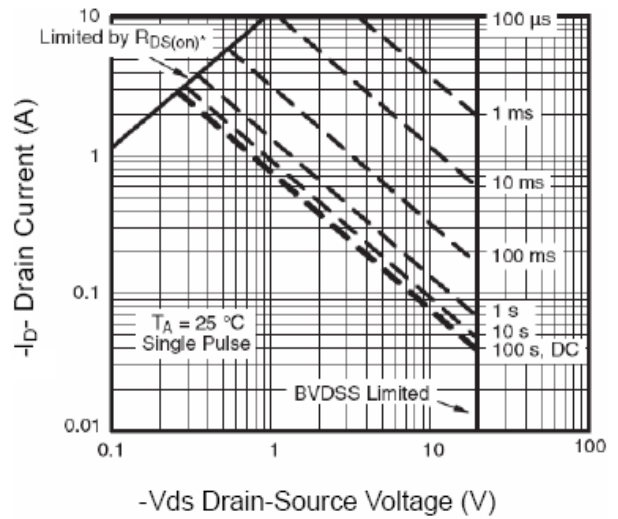
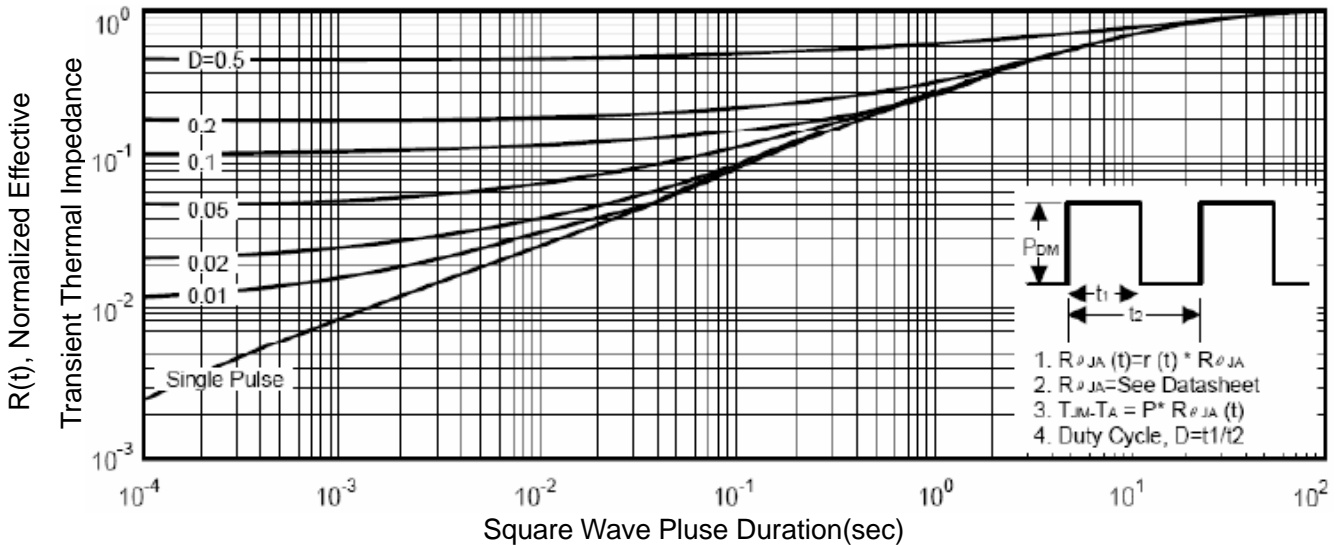
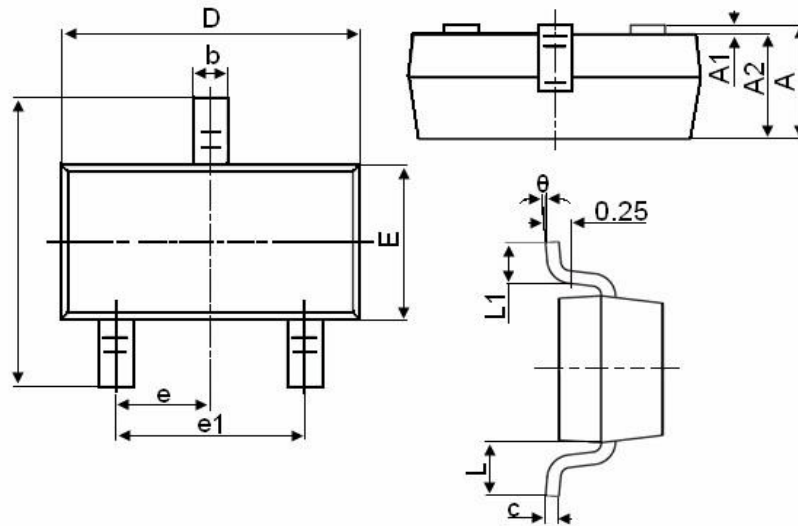


Figure11. Normalized Maximum Transient Thermal Impedance



Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°