

P-Channel Enhancement Mode Field Effect Transistor

$V_{DS} = -20V$, $I_D = -3A$, $R_{DS(ON)} = 68m\Omega(max)$

Features

- Trench Power LV MOSFET Technology
- High Power and Current Handling Capability
- Load Gate Charge

Applications

- PWM Applications
- Load Switch for Devices

Mechanical Data

- Case: SOT23 Package
- Halogen Free

Ordering Information

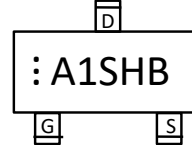
- Package :SOT23
- Reel Size :7 (inches)
- Quantity Per Reel :3,000 pcs

Package Outline



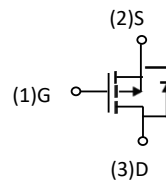
SOT23 Top View

Marking Information



"A1SHB" = Product Type Marking Code

Device Schematic & PIN Configuration



Pin Assignment		
1	G	Gate
2	S	Source
3	D	Drain

Maximum Ratings (@TA = +25°C, unless otherwise specified.)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current	I_D	-3.0	A
Pulsed Drain Current ⁽¹⁾	I_{DM}	-12	A
Power Dissipation ($T_C=25^\circ C$)	P_D	1.1	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$
Maximum Lead Temperature for Soldering Purposes, 1.8" from Case for 5 Seconds ⁽²⁾	T_L	300	$^\circ C$

Electrical Characteristics(@TA = +25°C, unless otherwise specified.)

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	BV_{DSS}	-20	-	-	V
Gate-Body Leakage Current	$V_{DS}=0V$, $V_{GS}=\pm 12V$	I_{GSS}	-	-	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS}=-20V$, $V_{GS}=0V$	I_{DSS}	-	-	-1	μA
Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=-250\mu A$	$V_{th(GS)}$	-0.45	-0.5	-1.1	V
Static Drain-Source	$V_{GS}=-4.5V$, $I_D=-2A$		-	54	68	m Ω
On-Resistance	$V_{GS}=-2.5V$, $I_D=-1A$	$R_{DS(ON)}$	-	69	98	
Input Capacitance	$V_{DS}=-10V$, $V_{GS}=0V$, $F=1MHz$	C_{iss}	-	533	-	pF
Output Capacitance		C_{oss}	-	72	-	
Reverse Transfer Capacitance		C_{rss}	-	67	-	
Total Gate Charge	$V_{GS}=-4.5V$, $V_{DS}=-10V$, $I_D=-3.0A^{(3)}$	Q_g	-	8.3	-	nC
Gate Source Charge		Q_{gs}	-	1.2	-	
Gate Drain Charge		Q_{gd}	-	1.6	-	
Turn-on Delay Time	$V_{GS}=-4.5V$, $V_{DD}=-10V$, $I_D=-1A$, $R_G=10\Omega^{(3)}$	$t_{D(ON)}$	-	12	-	ns
Turn-on Rise Time		t_r	-	35	-	
Turn-off Delay Time		$t_{D(OFF)}$	-	30	-	
Turn-off Fall Time		t_f	-	10	-	
Drain to Source Diode Forward Voltage	$I_S=-3.0A$, $V_{GS}=0V$	V_{SD}	-	-0.8	-1.2	V
Drain-Source Diode Forward Current		I_S	-	-	-3.0	A

Notes: 1.Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

2.Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch

3.Pulse Test : Pulse Width $\leq 300\mu s$, Duty cycle $\leq 0.5\%$



Rating and Characteristic Curves

FIG.1 - Typical Output Characteristics

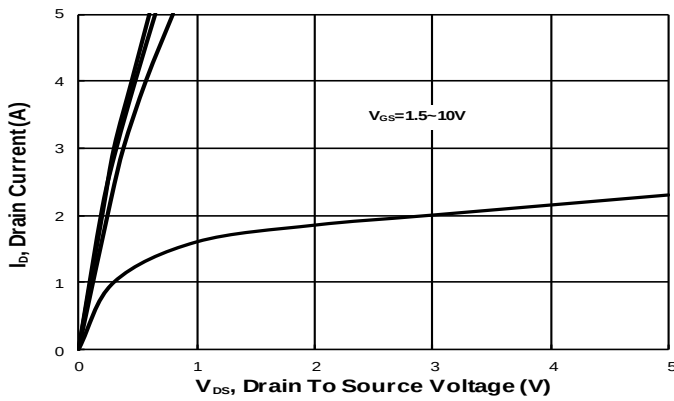


FIG.2 - On Resistance vs. Gate to Source Voltage

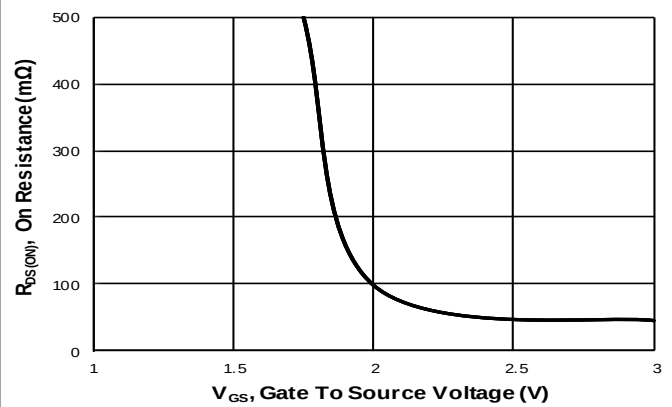


FIG.3 - Capacitance Characteristics

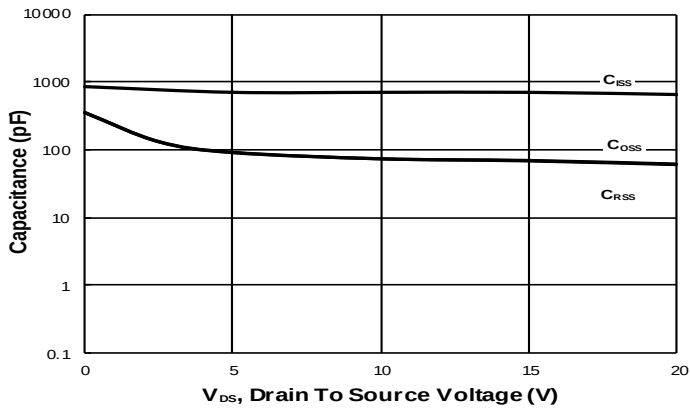


FIG.4 - Gate Charge Characteristics

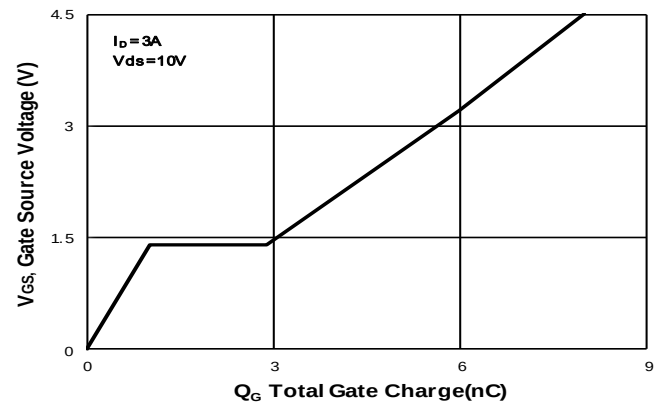


FIG.5 - Transfer Characteristics

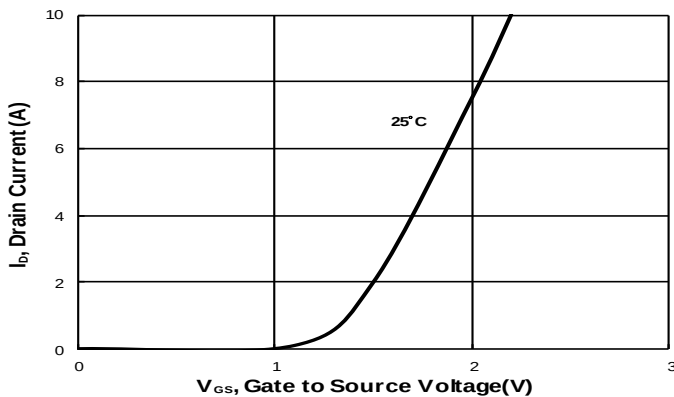
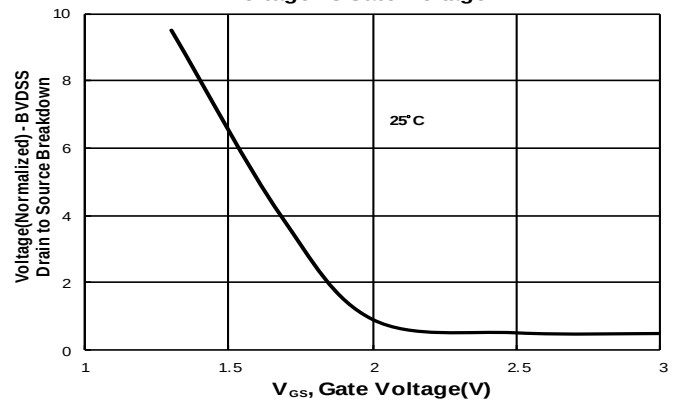


FIG.6 - Vds Drain to Source Voltage vs Gate Voltage





Rating and Characteristic Curves

FIG.7 - Body Diode Forward Voltage

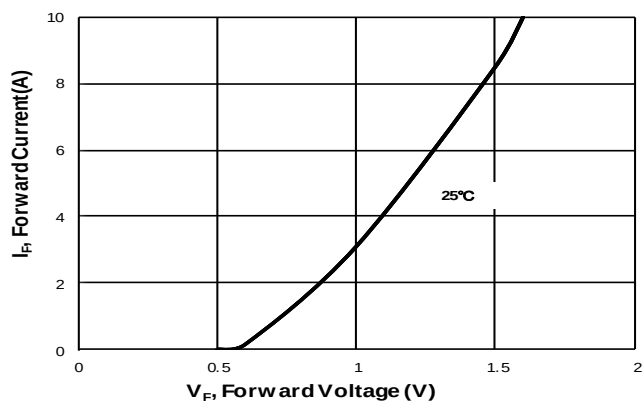


FIG.8 - Drain Source On Resistance

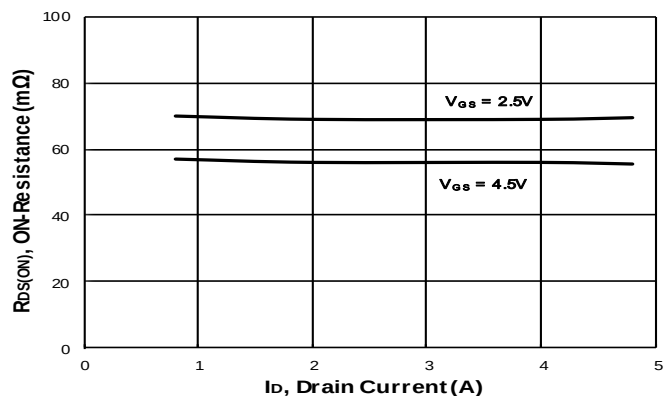


FIG.9 - Safe Operating Area

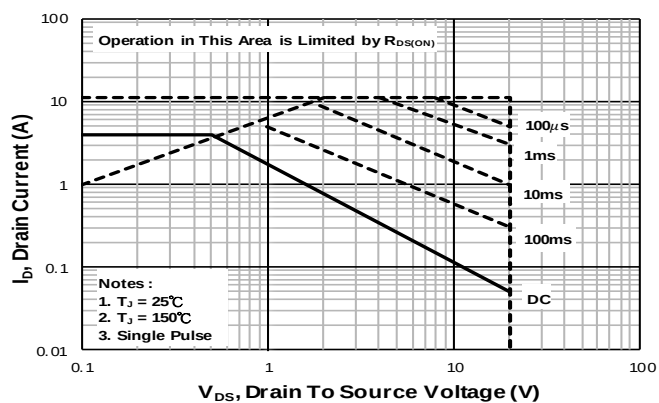


FIG.10 - Drain Current vs. Case Temperature

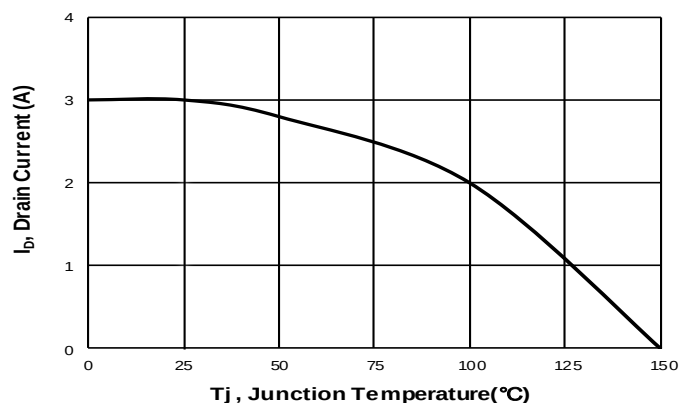
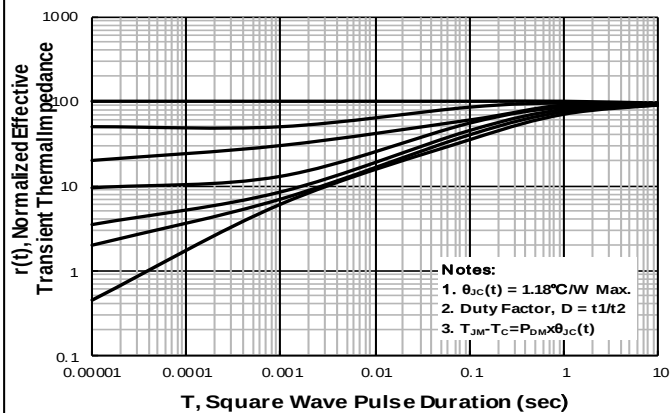
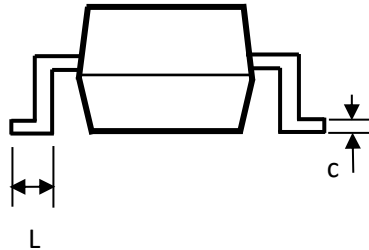
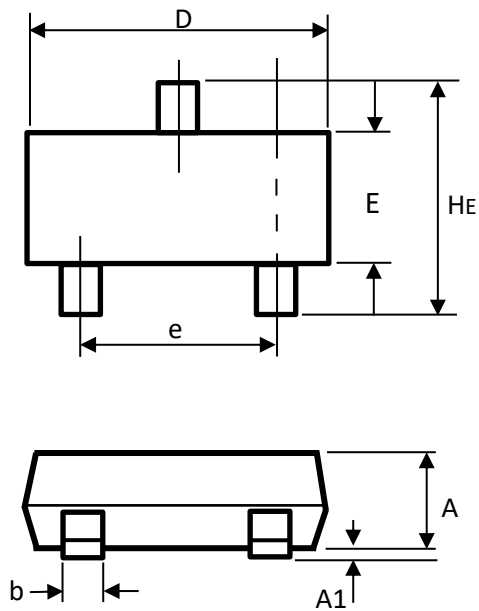


FIG.7 - Transient Thermal Response Curve



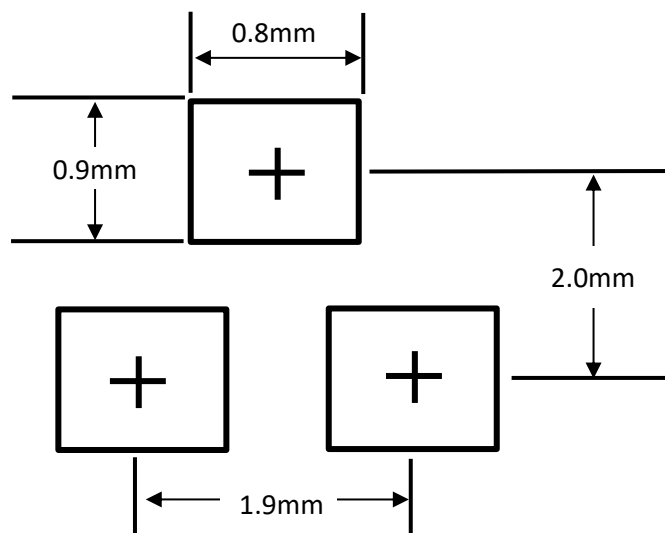


Package Outline Dimensions



SOT23 Package		
Dim	Min	Max
A	0.90	1.10
A1	0.00	0.10
b	0.35	0.50
c	0.09	0.11
D	2.80	3.00
E	1.20	1.60
e	1.80	2.00
L	0.20	0.45
HE	2.25	2.55
All Dimensions in mm		

Suggested Soldering Pad Layout



Note:

- 1.The pad layout is for reference purposes only.
- 2.General tolerance $\pm 0.05\text{mm}$



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