

## N-Channel Enhancement Mode Field Effect Transistor

### Product Summary

- $V_{DS}$  20V
- $I_D$  4.3A
- $R_{DS(ON)}$ ( at  $V_{GS}=4.5V$ ) <27 mohm
- $R_{DS(ON)}$ ( at  $V_{GS}=2.5V$ ) <37 mohm

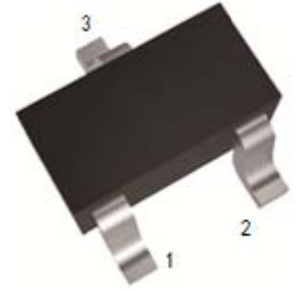
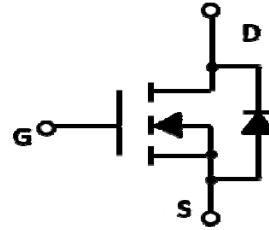
### General Description

- Trench Power LV MOSFET technology
- High Power and current handling capability
- Marking : A2SHB

### Applications

- PWM application
- Load switch

SC-59



1 : Gate 2 : Source 3 : Drain

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

Parameter	Symbol	Limit	Unit
Drain-source Voltage	$V_{DS}$	20	V
Gate-source Voltage	$V_{GS}$	$\pm 10$	V
Drain Current	$I_D$	$T_A=25^\circ\text{C}$ @ Steady State	4.3
		$T_A=70^\circ\text{C}$ @ Steady State	3.5
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	18	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	1.0	W
Thermal Resistance Junction-to-Ambient @ Steady State <sup>B</sup>	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V, T_C=25^{\circ}\text{C}$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 10V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.55	0.85	1.25	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=4.5V, I_D=4.3A$		21	27	m $\Omega$
		$V_{GS}=2.5V, I_D=3.0A$		29	37	
Diode Forward Voltage	$V_{SD}$	$I_S=4.3A, V_{GS}=0V$			1.2	V
Maximum Body-Diode Continuous Current	$I_S$				4.3	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V, f=1\text{MHz}$		595		pF
Output Capacitance	$C_{oss}$			106		
Reverse Transfer Capacitance	$C_{rss}$			59		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=4.5V, V_{DS}=10V, I_D=4.3A$		6.6		nC
Gate Source Charge	$Q_{gs}$			0.9		
Gate Drain Charge	$Q_{gd}$			1.4		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=4.5V, V_{DD}=10V, R_L=1.5\Omega, R_{GEN}=3\Omega$		13		ns
Turn-on Rise Time	$t_r$			54		
Turn-off Delay Time	$t_{D(off)}$			18		
Turn-off Fall Time	$t_f$			11		

 A. Pulse Test: Pulse Width $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

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

## Typical Performance Characteristics

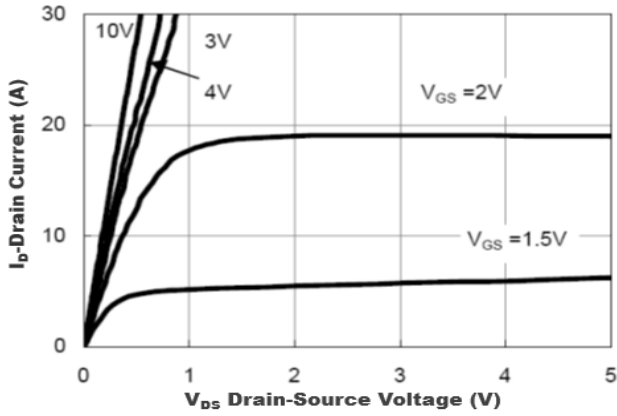


Figure1. Output Characteristics

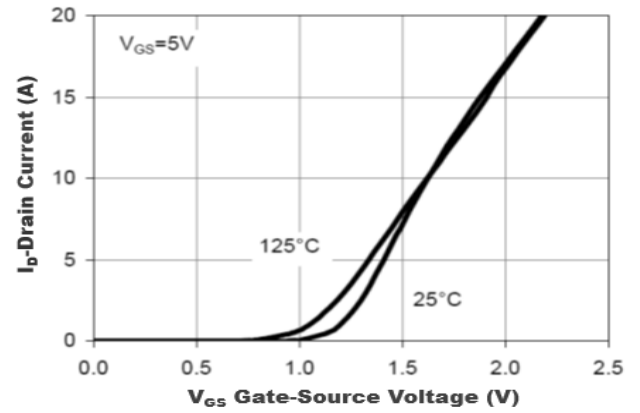


Figure2. Transfer Characteristics

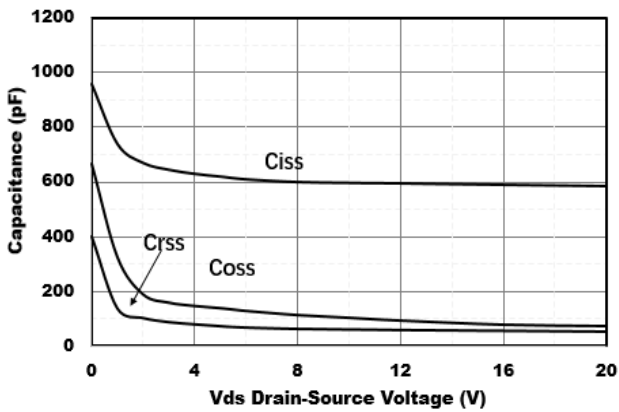


Figure3. Capacitance Characteristics

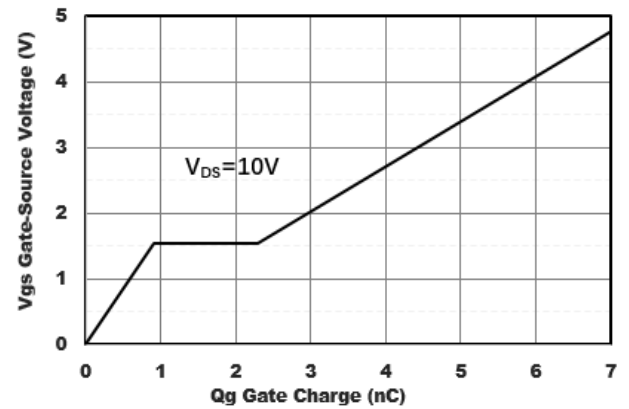


Figure4. Gate Charge

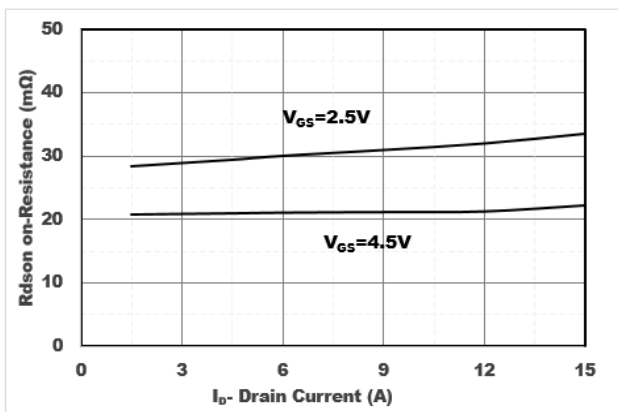


Figure5. Drain-Source on Resistance

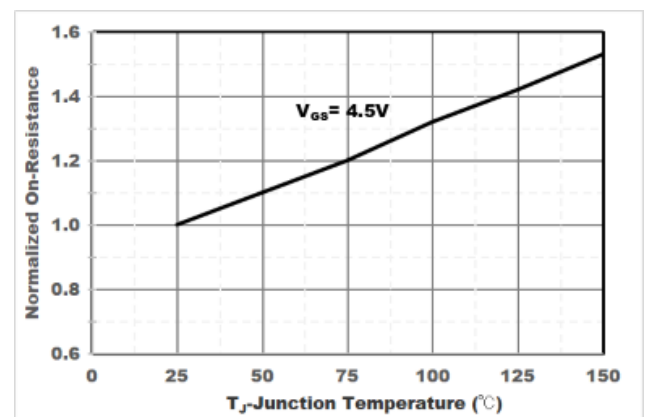


Figure6. Drain-Source on Resistance

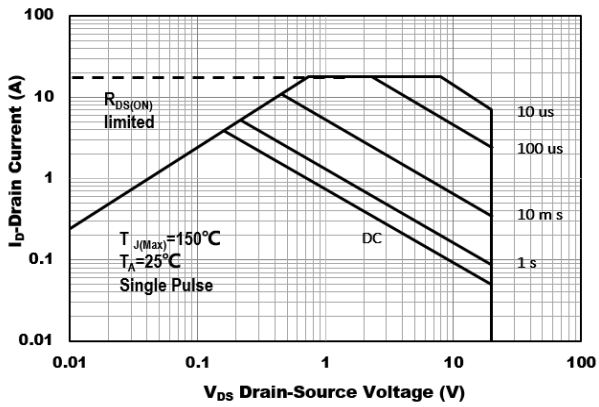


Figure7. Safe Operation Area

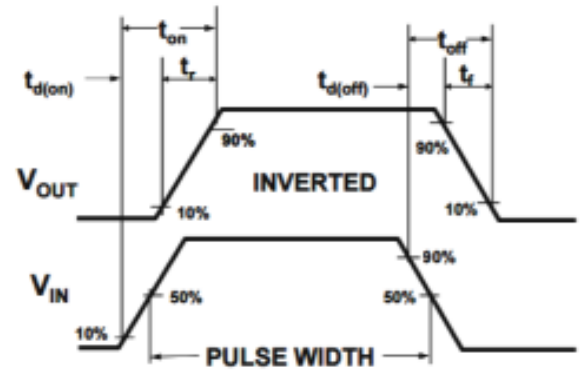
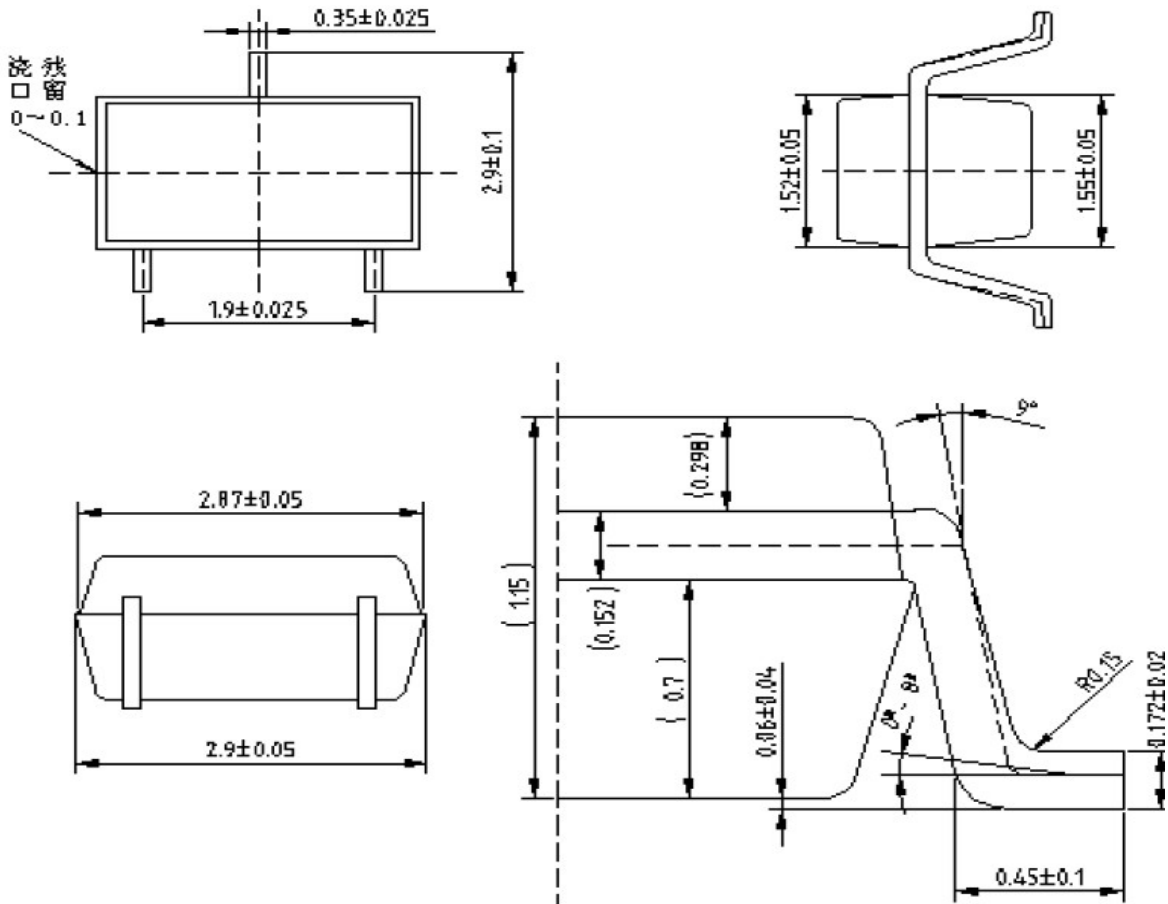


Figure8. Switching wave

Package Outline Dimensions (UNIT: mm)

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