

P-Channel Enhancement Mode Field Effect Transistor

Product Summary

- V_{DS} -20V
- I_D -3.4A
- $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) <64 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-2.5V$) <80 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-1.8V$) <95 mohm

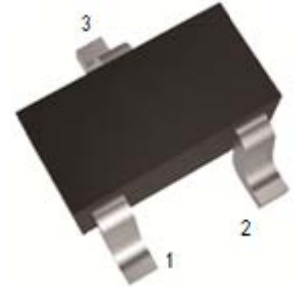
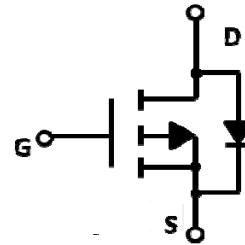
General Description

- Trench Power LV MOSFET technology
- High Power and Current handling capability
- Low Gate Charge
- Marking : Δ 1SHB

Applications

- PWM applications
- Power management
- Load switch

SC-59



1 : Gate 2 : Source 3 : Drain

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

Parameter		Symbol	Maximum	Unit
Drain-source Voltage		V_{DS}	-20	V
Gate-source Voltage		V_{GS}	± 10	V
Drain Current	$T_A=25^\circ\text{C}$	I_D	-3.4	A
	$T_A=70^\circ\text{C}$		-2.7	
Pulsed Drain Current ^A		I_{DM}	-14	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$		P_D	1	W
Thermal Resistance Junction-to-Ambient ^B		$R_{\theta JA}$	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
Static Parameter						
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	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 10V, V_{DS}=0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.4	-0.62	-1.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.4A$		49	64	m Ω
		$V_{GS}=-2.5V, I_D=-3A$		59	80	
		$V_{GS}=-1.8V, I_D=-2.5A$		79	95	
Diode Forward Voltage	V_{SD}	$I_S=-3.4A, V_{GS}=0V$		-0.8	-1.2	V
Maximum Body-Diode Continuous Current	I_S				-3.4	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=-10V, V_{GS}=0V, f=1\text{MHz}$		550		pF
Output Capacitance	C_{oss}			89		
Reverse Transfer Capacitance	C_{rss}			65		
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=-4.5V, V_{DS}=-10V, I_D=-3.4A$		4.3		nC
Gate Source Charge	Q_{gs}			0.8		
Gate Drain Charge	Q_{gd}			1.1		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=-4.5V, V_{DD}=-10V, I_D=-1A, R_{GEN}=2.5\Omega$		12		ns
Turn-on Rise Time	t_r			54		
Turn-off Delay Time	$t_{D(off)}$			15		
Turn-off Fall Time	t_f			9		

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

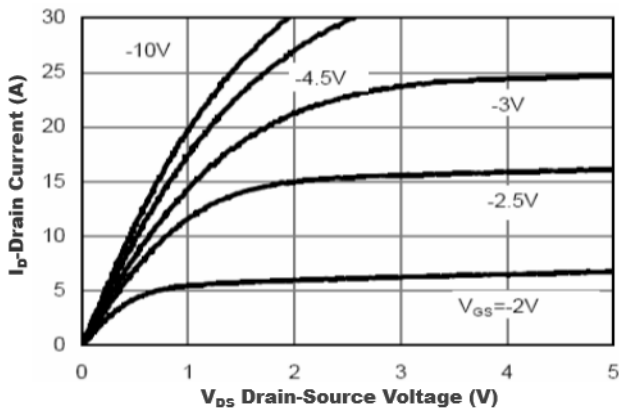


Figure1. Output Characteristics

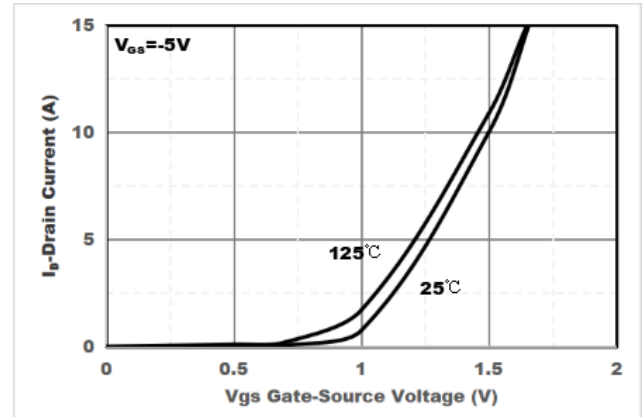


Figure2. Transfer Characteristics

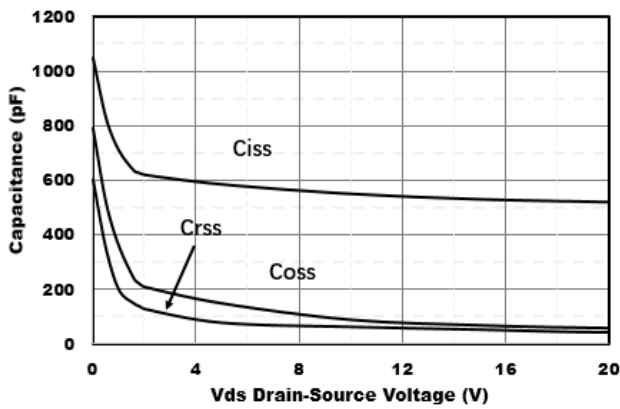


Figure3. Capacitance Characteristics

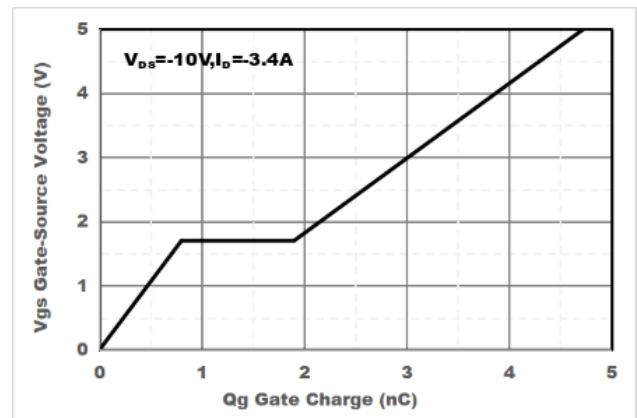


Figure4. Gate Charge

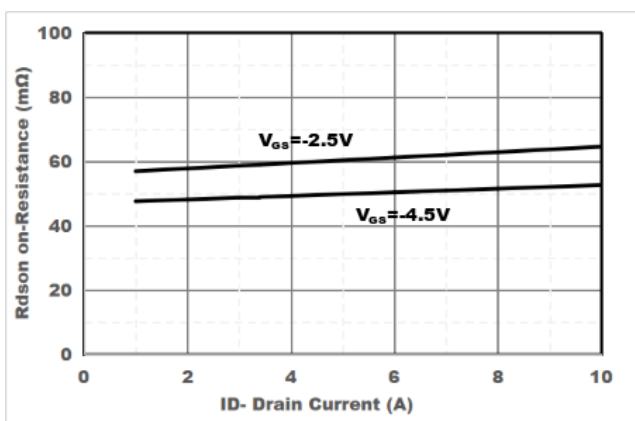


Figure5. Drain-Source on Resistance

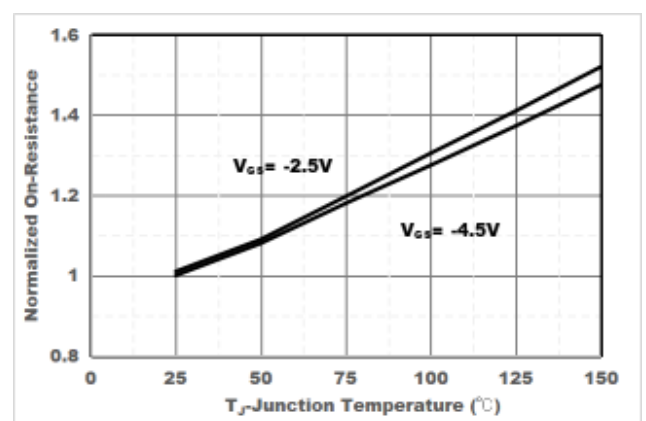


Figure6. Drain-Source on Resistance

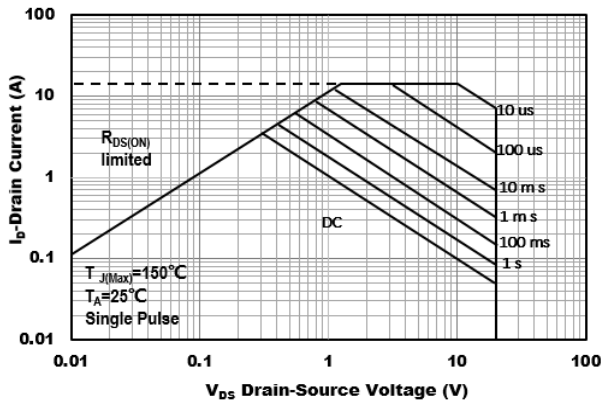


Figure7. Safe Operation Area

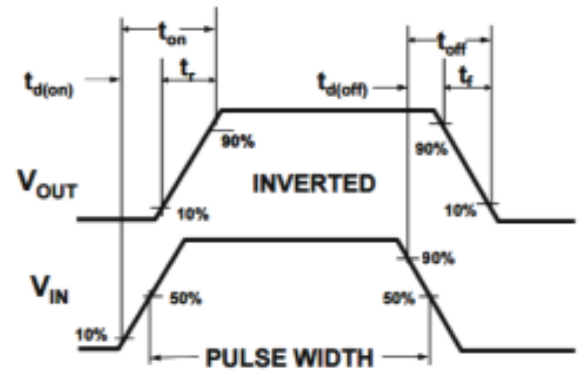
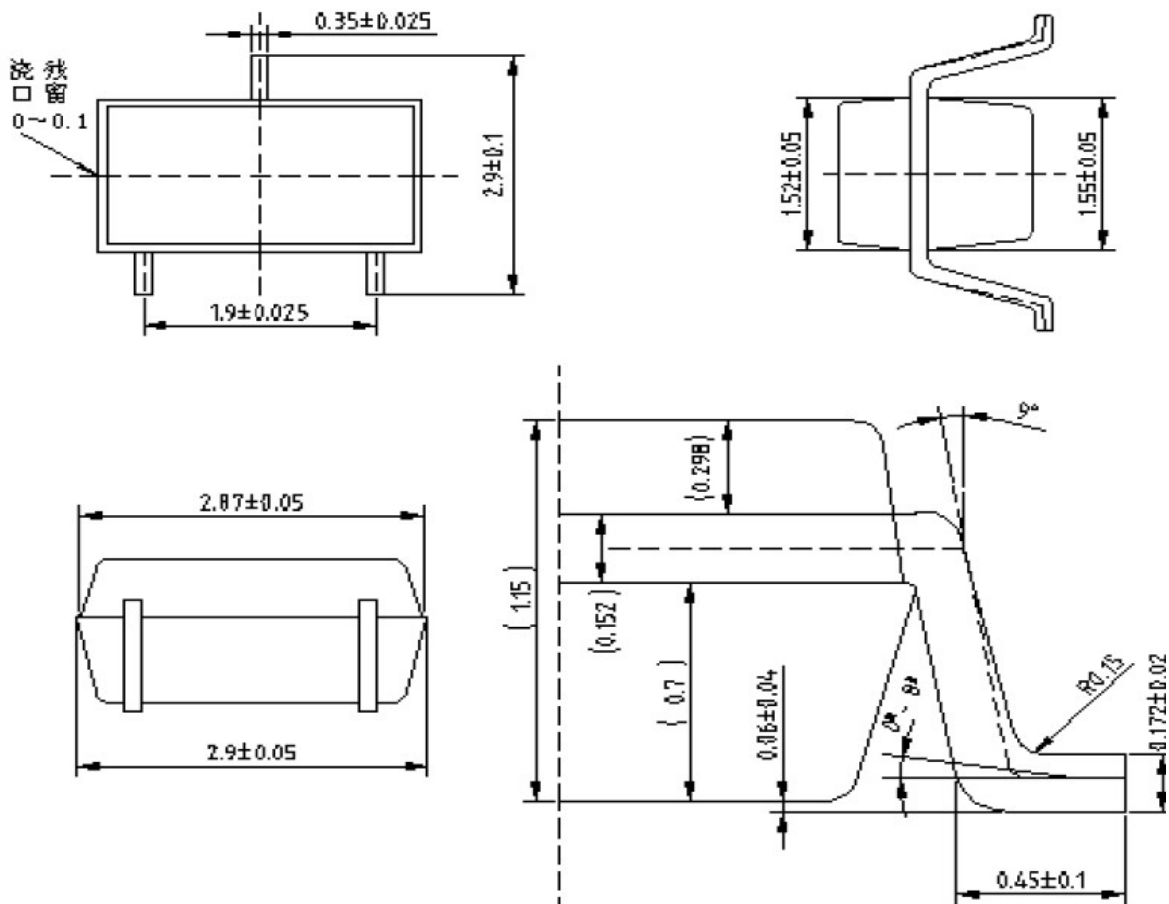


Figure8. Switching wave

Package Outline Dimensions (UNIT: mm)

SC-59



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