

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	$I_D$
-20V	51mΩ@-4.5V	-3.4A
	67mΩ@-2.5V	
	100mΩ@-1.8V	

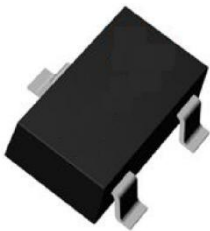
## Feature

- Trench power LV MOSFET technology
- High power and current handing capability
- Low gate charge

## Application

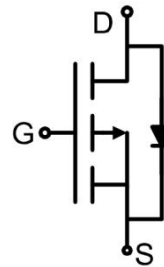
- PWM applications
- Power management
- Load switch

## Package

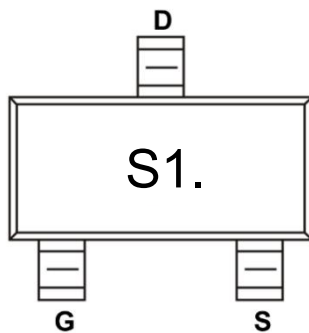


SOT-23

## Circuit diagram



## Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Continuous Drain Current	$I_D$	-3.4	A
Continuous Drain Current ( $T_A=70^{\circ}\text{C}$ )	$I_D(70^{\circ}\text{C})$	-2.7	A
Pulsed Drain Current <sup>1)</sup>	$I_{DM}$	-14	A
Power Dissipation	$P_D$	1	W
Thermal Resistance Junction to Ambient <sup>2)</sup>	$R_{\theta JA}$	125	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature	$T_J$	-55 ~ +150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 ~ +150	$^{\circ}\text{C}$

### Electrical characteristics ( $T_J=25^{\circ}\text{C}$ , unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-20			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS}=-20\text{V}, V_{GS}=0\text{V}$			-1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{GS}=\pm 10\text{V}, V_{DS}=0\text{V}$			$\pm 100$	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.4	-0.62	-1	V
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS}=-4.5\text{V}, I_D=-3.4\text{A}$		42	51	m $\Omega$
		$V_{GS}=-2.5\text{V}, I_D=-3\text{A}$		55	67	
		$V_{GS}=-1.8\text{V}, I_D=-2.5\text{A}$		86	100	
<b>Dynamic characteristics<sup>3)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-10\text{V}, V_{GS}=0\text{V}, f=1\text{MHz}$		438		pF
Output Capacitance	$C_{oss}$			76		
Reverse Transfer Capacitance	$C_{rss}$			62		
Total Gate Charge	$Q_g$	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-3.4\text{A}$		5.41		nC
Gate-Source Charge	$Q_{gs}$			1.17		
Gate-Drain Charge	$Q_{gd}$			1.24		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=-10\text{V}, V_{GS}=-4.5\text{V}, I_D=-1\text{A}, R_{GEN}=3\Omega$		6.4		nS
Turn-on rise time	$t_r$			21.8		
Turn-off delay time	$t_{d(off)}$			37.4		
Turn-off fall time	$t_f$			34		
<b>Source-Drain Diode characteristics</b>						
Diode Forward Current	$I_S$				-3.4	A
Diode Forward voltage	$V_{SD}$	$V_{GS}=0\text{V}, I_S=-3.4\text{A}$			-1.2	V
Reverse Recovery Time	$t_{rr}$	$I_F=-3.4\text{A}, di/dt=-100\text{A}/\mu\text{s}$		24.5		nS
Reverse Recovery Charge	$Q_{rr}$			4		nC

Notes:

- 1) Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
- 2)  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JC}$  is guaranteed by design, while  $R_{\theta JA}$  is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.
- 3) Guaranteed by design, not subject to production testing.

## Typical Characteristics

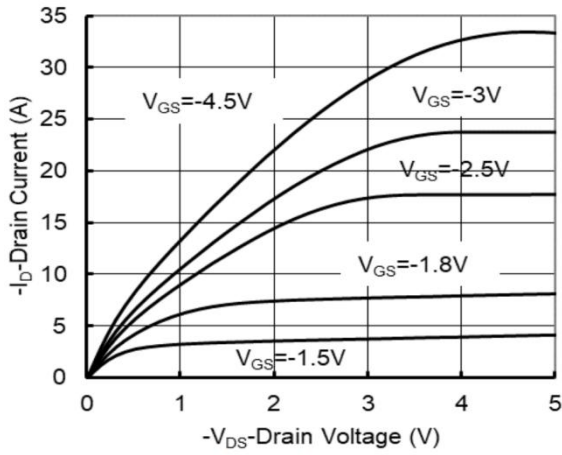


Figure1. Output Characteristics

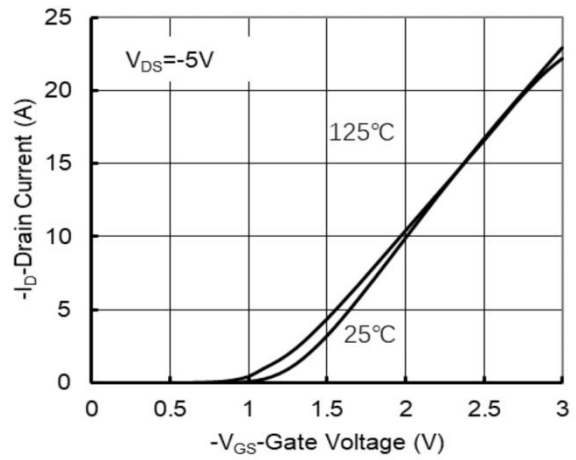


Figure2. Transfer Characteristics

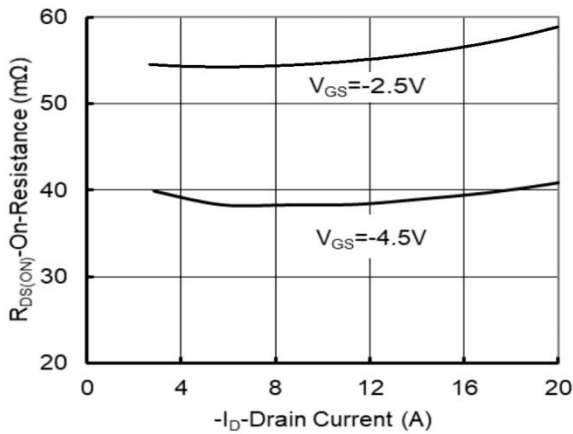


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

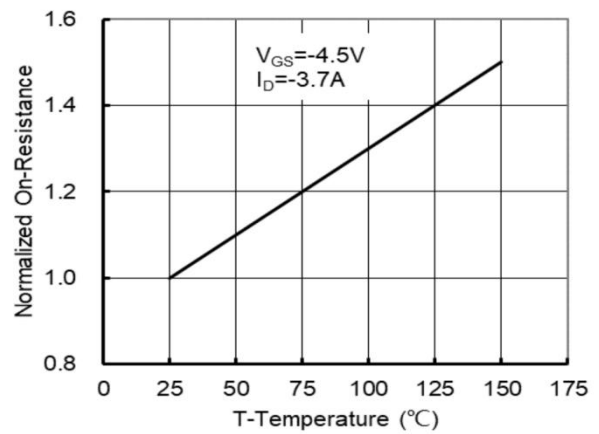


Figure 4: On-Resistance vs. Junction Temperature

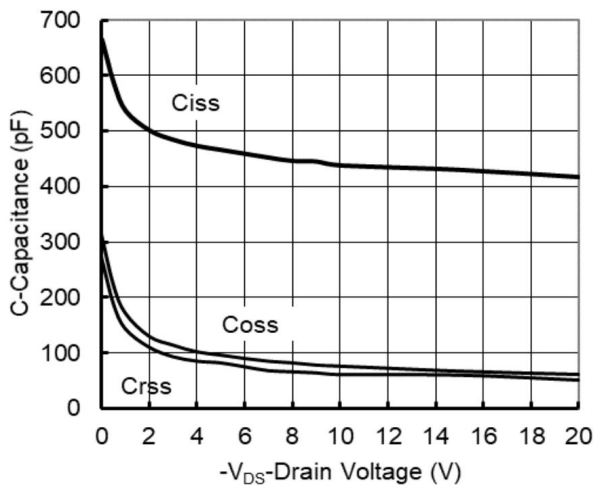


Figure5. Capacitance Characteristics

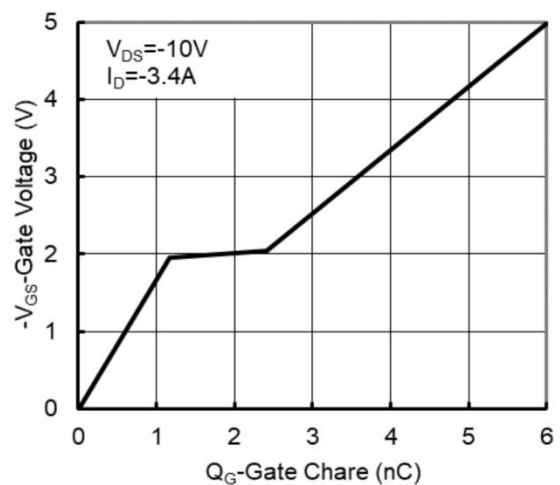


Figure6. Gate Charge

## Typical Characteristics

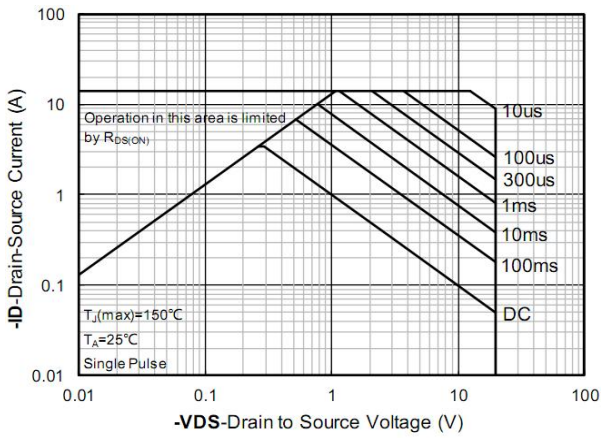


Figure7. Safe Operation Area

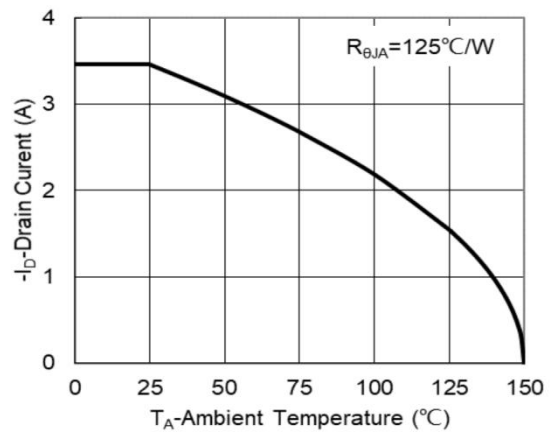


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

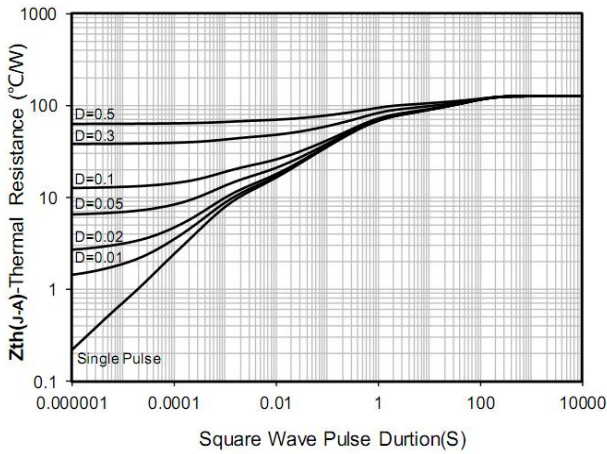
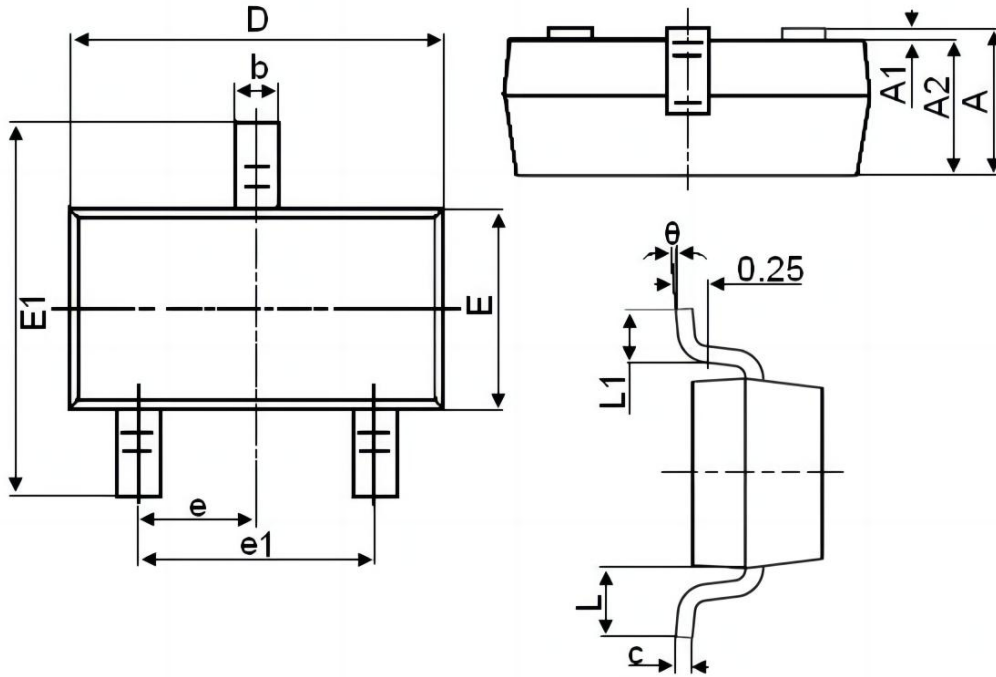


Figure9. Maximum Transient Thermal Impedance

### SOT-23 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
C	0.080	0.200	0.003	0.008
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.550 REF.		0.022 REF.	
L1	0.300	0.500	0.012	0.020
theta	0°	8°	0°	8°