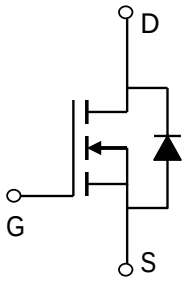
N-Channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The SI2302 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 2.5V. This device is suitable for use as a Battery protection or in other Switching application.

FEATURES

VDS = 20V ID =2.3A
RDS(ON) < 75mΩ @ VGS=4.5V
Available in a 3-Pin SOT23-3 Package



Application

Battery protection
Load switch
Uninterruptible power supply

SOT-23-3L
(TOP VIEW)

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain current-continuous note1@Tj=125℃	ID	2.3	A
-pulse d note2	I_{DM}	8	A
Drain-source Diode forward current	I_S	2	A
maximum Power Dissipation	P_D	1.25	W
Operating Junction Temperature Range	T_J	-55 To 150	℃
Thermal Resistance Junction-to ambient	Rth JA	100	℃/W

Note :

1、 surface mounted on FR4 board,t≤10sec

2、 pulse test: pulse width≤300μs,duty≤2%

ELECTRICAL CHARACTERISTICS

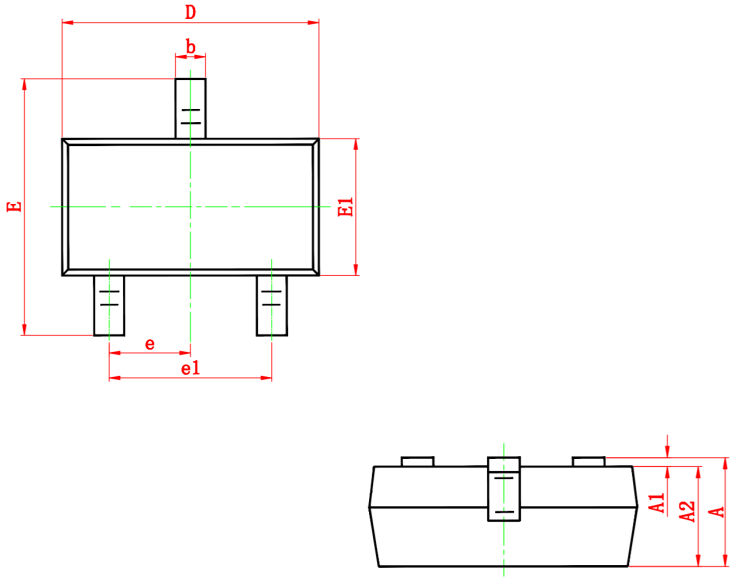
(TA = 25°C, unless otherwise noted.)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.5	0.75	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=2A	-	55	75	mΩ
		V_{GS}=2.5V, I_D=1A		68	90	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=2A	-	5	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=10V,V_{GS}=0V, F=1.0MHz	-	180	-	PF
Output Capacitance	C_{oss}		-	38	-	PF
Reverse Transfer Capacitance	C_{rss}		-	20	-	PF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V,RL=3Ω V_{GS}=4.5V,R_{GEN}=6Ω	-	8	-	nS
Turn-on Rise Time	t_r		-	7	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	7	-	nS
Total Gate Charge	Q_g	V_{DS}=10V,I_D=3A, V_{GS}=4.5V	-	3.5	-	nC
Gate-Source Charge	Q_{gs}		-	0.6	-	nC
Gate-Drain Charge	Q_{gd}		-	0.45	-	nC
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=3A	-	0.76	1.16	V

Note :

1、 guaranteed by design, not subject to production testing

PACKAGE DESCRIPTION



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	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	2.250	2.550	0.089	0.100
E1	1.200	1.400	0.047	0.055
e	0.950 TYP.		0.037 TYP.	
e1	1.800	2.000	0.071	0.079
L	0.300	0.500	0.012	0.020
L1	0.550 REF.		0.022 REF.	
θ	0°	8°	0°	8°

Notes

1. All dimensions are in millimeters.
2. Tolerance ±0.10mm (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.