

# SI2314EDS

## PRODUCT SUMMARY

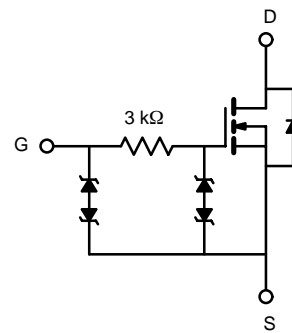
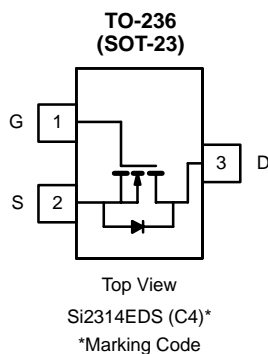
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
20	0.033 @ $V_{GS} = 4.5$ V	4.9
	0.040 @ $V_{GS} = 2.5$ V	4.4
	0.051 @ $V_{GS} = 1.8$ V	3.9

## FEATURES

- TrenchFET® Power MOSFET
- ESD Protected: 3000 V

## APPLICATIONS

- Li-Ion Battery Protection



## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	5 sec	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	20		V	
Gate-Source Voltage	$V_{GS}$	$\pm 12$			
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	4.9	3.77	A
		$T_A = 70^\circ\text{C}$	3.9	3.0	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	15			
Avalanche Current <sup>b</sup>	$I_{AS}$	15		mJ	
Single Avalanche Energy	$E_{AS}$	11.25			
Continuous Source Current (Diode Conduction) <sup>a</sup>	$I_S$	1.0		A	
Power Dissipation <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.25	0.75	W
		$T_A = 70^\circ\text{C}$	0.80	0.48	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$	

## THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>a</sup>	$R_{thJA}$	$t \leq 5$ sec	75	100	$^\circ\text{C/W}$
		Steady State	120	166	
Maximum Junction-to-Foot	$R_{thJF}$	40	50		

Notes

- Surface Mounted on 1" x 1" FR4 Board.
- Pulse width limited by maximum junction temperature



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SPECIFICATIONS (T <sub>A</sub> = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Conditions	Limits			Unit
			Min	Typ	Max	
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	20			V
Gate-Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	0.45			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±4.5 V			±1.5	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 16 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 70°C			75	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 10 V, V <sub>GS</sub> = 4.5 V	15			A
Drain-Source On-Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.0 A		0.027	0.033	Ω
		V <sub>GS</sub> = 2.5 V, I <sub>D</sub> = 4.5 A		0.033	0.040	
		V <sub>GS</sub> = 1.8 V, I <sub>D</sub> = 4.0 A		0.042	0.051	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 5.0 A		40		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> = 1.0 A, V <sub>GS</sub> = 0 V		0.8	1.2	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 10 V, V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 5.0 A		11.0	14.0	nC
Gate-Source Charge	Q <sub>gs</sub>			1.5		
Gate-Drain Charge	Q <sub>gd</sub>			2.1		
<b>Switching</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 10 V, R <sub>L</sub> = 10 Ω I <sub>D</sub> ≅ 1.0 A, V <sub>GEN</sub> = 4.5 V, R <sub>G</sub> = 6 Ω		0.53	0.8	μs
Rise Time	t <sub>r</sub>			1.4	2.2	
Turn-Off Delay Time	t <sub>d(off)</sub>			13.5	20	
Fall-Time	t <sub>f</sub>			5.9	9	
Source-Drain Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 1.0 A, di/dt = 100 A/μs		13	25	ns

Notes

- a. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.