GOOD-ARK SEMICONDUCTOR

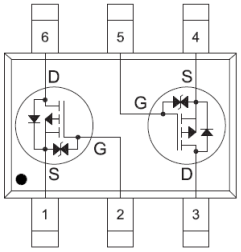
S3139KDW

20V Dual P-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	-20V
$R_{DS(on)}$	520mΩ@-4.5V
	700mΩ@-2.5V
	950mΩ(TYP)@-1.8V
I_D	-400mA

SOT-363



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for notebook, load switch, networking and hand-held devices
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The S3139KDW utilizes the latest techniques to achieve high cell density, low on-resistance and high repetitive avalanche rating. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GS}	±12	
Drain Current-Continuous	$I_{D(DC)}$	-0.66	A
Drain Current -Pulsed[1]	$I_{DM(pulse)}$	-2.64	
Power Dissipation[2]	P_D	150	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	833	°C/W
Storage Temperature	T_j	150	°C
Junction Temperature	T_{STG}	-55 to +150	

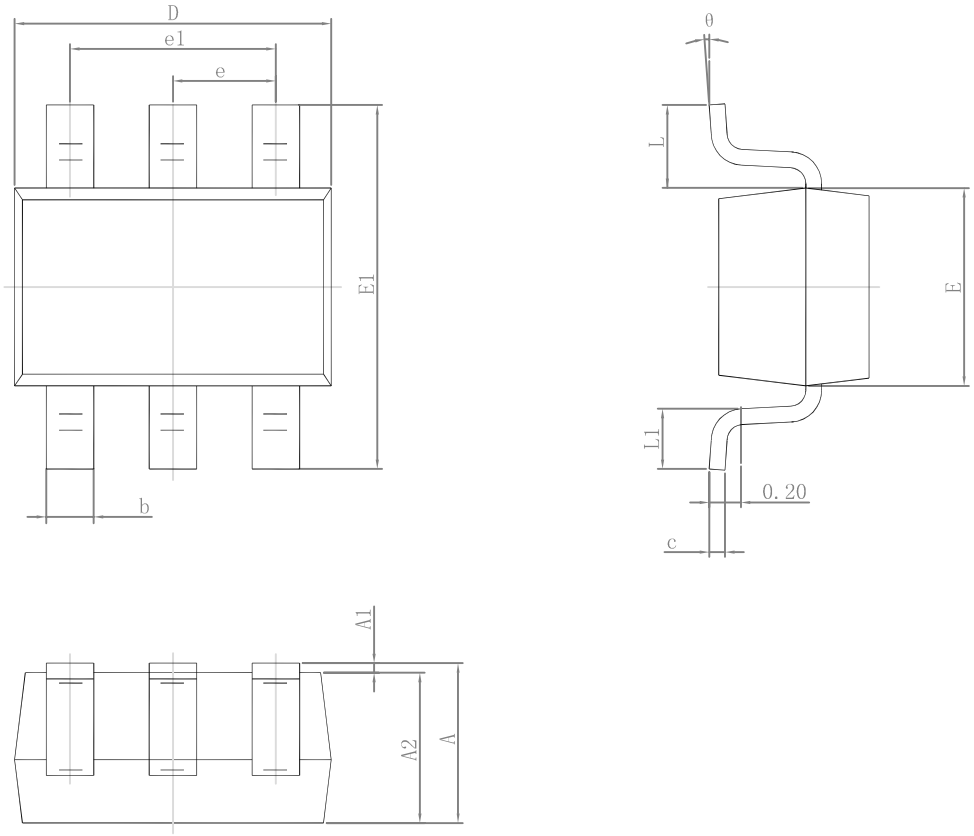
Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
On/Off States						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-20	---	---	V
Gate-Threshold Voltage[3]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.35	---	-1.1	
Gate-Body Leakage Current	I_{GSS}	V_{DS} =0V, V_{GS} =±12V	---	---	±20	μA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =-20V, V_{GS} =0V	---	---	-1	μA
Drain-Source On-State Resistance[3]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-1A	---	---	520	mΩ
		V_{GS} =-2.5V, I_D =-800mA	---	---	700	
		V_{GS} =-1.8V, I_D =-500mA	---	---	950	
Forward Transconductance	g_{FS}	V_{DS} =-10V, I_D =-540mA	0.8	---	---	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} =-16V,V_{GS} =0V,f =1MHz	---	---	170	pF
Output Capacitance	C_{oss}		---	---	25	
Reverse Transfer Capacitance	C_{rss}		---	---	15	
Switching Times						
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-10V, I_D=-200mA, V_{GS}=-4.5V,R_G=10Ω	---	9	---	ns
Rise Time	t_r		---	5.8	---	
Turn-Off Delay Time	$t_{d(off)}$		---	32.7	---	
Fall Time	t_f		---	20.3	---	
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage[3]	V_{SD}	I_S=-0.5A, V_{GS} = 0V	---	---	-1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. This test is performed with no heat sink at T_a=25℃.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle≤0.5%.

Package Outline Dimensions SOT-363



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°