Green Power Semiconductor, Inc.

GP3419

P–channel Enhancement Mode MOSFET

GENERAL DESCRIPTION

The GP3419 is P-channel enhancement mode MOSFET designed by advanced trench process technology provides the designer with the best combination of fast switching response, low on-resistance, and low cost.

The SOT23 package is space saving surface mount for all commercial and industrial applications. It is suitable for low voltage, low loss and fast switching applications such as Li-ion battery pack applications.

FEATURES

- **-3.5A, -20V, $R_{DS(ON)}$ < 145mΩ @ V_{GS} = -2.5V**
- **-3.5A, -20V, $R_{DS(ON)}$ < 95mΩ @ V_{GS} = -4.5V**
- **-3.5A, -20V, $R_{DS(ON)}$ < 75mΩ @ V_{GS} = -10.0V**
- **High performance trench technology for extremely low $R_{DS(ON)}$**
- **Low gate charge**
- **Fast switching speed**

APPLICATIONS

- Load Switch
- DC-DC Converter

PACKAGE PIN OUT

SOT23

MARKING INFORMATION

Part Number	Marking	Package
GP3419	xxww	SOT23

xx: Year   ww: Production date code

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current I_D@ T_A = 25°C	I_D	-3.5	A
Pulsed Drain Current [1] I_{DM}	I_{DM}	-15	A
Total Power Dissipation P_D@ T_A = 25°C	P_D	1.4	W
Storage Temperature Range	T_{STG}	-55 to +150	°C
Operation Junction Temperature Range	T_J	-55 to +150	°C
THERMAL CHARACTERISTICS			
Thermal Resistance, Junction-to-Ambient	$R_{thj-amb}$	90	°C/W
Thermal Resistance, Junction-to-Case	R_{thj-c}	80	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)						
Parameter	Symbol	Test Conditions	GP3419			Units
			Min	Typ	Max	
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20			V
Static Drain-source On=Resistance	$R_{DS(ON)}$	V_{GS}=-2.5V, I_D=-1.0A		110	145	mΩ
		V_{GS}=-4.5V, I_D=-3.0A		75	95	mΩ
		V_{GS}=-10V, I_D=-3.5A		58	75	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.7	-0.9		V
Forward Transconductance	g_{fs}	V_{DS}=-5V, I_D=-2.0A		5		S
Gate Resistance	R_g	V_{DS}=0V, V_{GS} =0V, f=1.0MHz		0.6		Ω
Drain-Source Leakage Current (Tj=25°C)	I_{DSS}	V_{DS}=-16V, V_{GS} =0V			1	μA
Gate-Source Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Total Gate Charge [2]	Q_g	I_D=-3.5A		3.5		nC
Gate-Source Charge	Q_{gs}	V_{DS}=-10V		0.6		nC
Gate-Drain ("Miller") Charge	Q_{gd}	V_{GS}=-4.5V		1.1		nC
Turn-On Delay Time [2]	$t_{d(on)}$	V_{DS}=-10V		10		ns
Turn-On Rise Time	t_r	I_D=-1A		11		ns
Turn-Off Delay Time	$t_{d(off)}$	R_G=3Ω, V_{GS}=-10V		28		ns
Turn-Off Fall Time	t_f	R_D=2.8Ω		13.5		ns
Input Capacitance	C_{iss}	V_{GS}=0V		356		pF
Output Capacitance	C_{oss}	V_{DS}=-10V		80		pF
Reverse Transfer Capacitance	C_{rss}	f=1.0MHz		39		pF

SOURCE-DRAIN DIODE						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Continuous Source Current (Body Diode)	I_S	V_D=V_G=0V, V_S=-1.2V			-1.7	A
Pulsed Source Current (Body Diode)	I_{SM}				-8.0	A
Forward On Voltage [2]	V_{SD}	Tj=25°C, I_S=-1.7A, V_{GS}=0V			-1.2	V

Notes:
1. Pulse width limited by safe operating area.
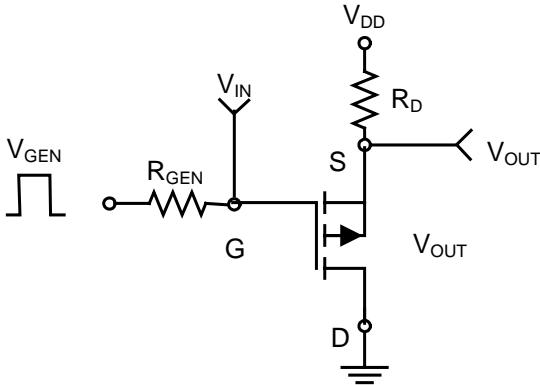2. Pulse width ≦300μs, duty cycle ≦2%.
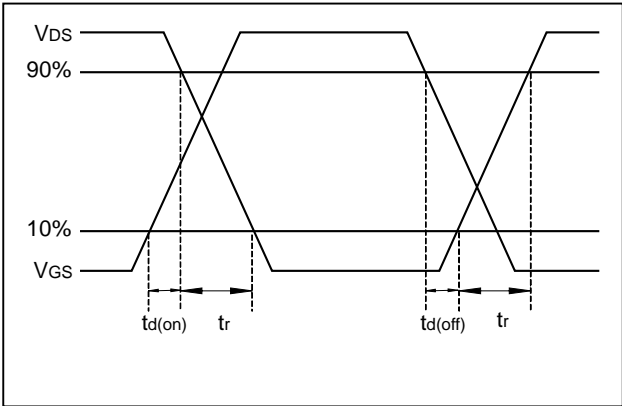
Fig 1. Switching Time Circuit

Fig 2. Switching Time Waveform

Package Information

Surface Mount SOT-23

	INCHES			MILLIMETERS		
	MIN	TYP	MAX	MIN	TYP	MAX
A	0.039	0.043	0.051	1.00	1.10	1.30
A1	0.000	-	0.004	0.00	-	0.10
A2	0.028	0.032	0.035	0.70	0.80	0.90
b	0.014	0.016	0.020	0.35	0.40	0.50
C	0.004	0.005	0.010	0.10	0.15	0.25
D	0.106	0.114	0.122	2.70	2.90	3.10
E	0.055	0.063	0.071	1.40	1.60	1.80
e	0.075 TYP.			1.90 TYP.		
H	0.102	0.110	0.118	2.60	2.80	3.00
L	0.015	-	-	0.37	-	-
M	1°	5°	9°	1°	5°	9°