



20V Full-bridge of MOSFET

General Description

- Low gate charge.
- Use as a load switch.
- Use in PWM applications

Product Summary

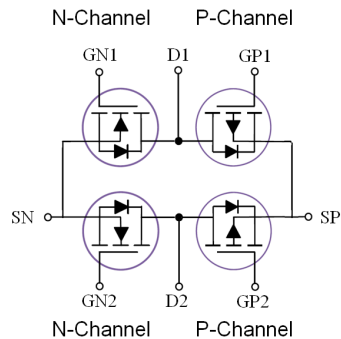
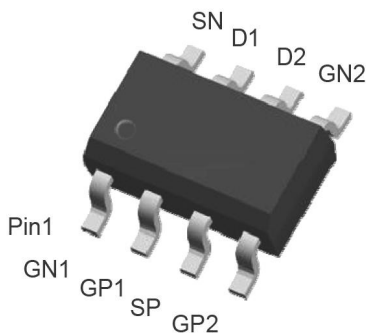
N-Channel

- $BV_{DSS} = 20V$
- $R_{DS(on)} (@VGS = 10V) < 70m\Omega$
- $R_{DS(on)} (@VGS = 4.5V) < 80m\Omega$

P-Channel

- $BV_{DSS} = -20V$
- $R_{DS(on)} (@VGS = -10V) < 150m\Omega$
- $R_{DS(on)} (@VGS = -4.5V) < 160m\Omega$

SOT23-8



Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Maximum		Units
		N-Channel	P-Channel	
Drain-Source Voltage	V_{DS}	20	-20	V
Gate-Source Voltage	V_{GS}	± 10	± 10	V
Drain Current ($T_A=25^\circ C, t<10s, V_{GS}=10V$)	I_D	2.0	-1.8	A
Drain Current ($T_A=75^\circ C, t<10s, V_{GS}=10V$)		1.2	-1.0	A
Pulsed Drain Current ^a	I_{DM}	12	-10	A
Power Dissipation ^b ($T_A=25^\circ C$)	P_D	1.4	1.4	W
Power Dissipation ^b ($T_A=75^\circ C$)		1.0	0.9	W
Junction and Storage Temperature Range	T_J, T_{STG}	-55 ~ +150	-55 ~ +150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Maximum		Units
		P-Channel	N-Channel	
Junction-to-Ambient ^a ($t \leq 10s$)	$R_{\theta JA}$	100	100	$^\circ C/W$
Junction-to-Ambient ^{a,d} (Steady-State)		130	130	$^\circ C/W$
Junction-to-Lead (Steady-State)	$R_{\theta JL}$	90	90	$^\circ C/W$



N-Channel Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 10V, V_{DS} = 0V$			± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.45	0.6	1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 2.5A$		60	70	m Ω
		$V_{GS} = 4.5V, I_D = 2.0$		65	80	m Ω
g_{FS}	Forward Transconductance	$V_{DS} = 5V, I_D = 1.5A$		20		S
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = 1.0A$			1.2	V
I_S	Maximum Body-Diode Continuous Current				1.5	A
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = 10V, V_{GS} = 0V$ $f = 1.0MHz$		560		pF
C_{oss}	Output Capacitance			83		pF
C_{rss}	Reverse Transfer Capacitance			64		pF
Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS} = 10V, I_D = 2.0A$ $V_{GS} = 6V$		8.5		nC
Q_{gs}	Gate-Source Charge			2.1		nC
Q_{gd}	Gate-Drain Charge			2.6		nC
$t_{D(ON)}$	Turn-On Delay Time	$V_{DD} = 10V, I_D = 1A$ $V_{GS} = 6V$ $R_{GEN} = 6\text{ ohm}$		4		ns
t_r	Turn-On Rise Time			3.2		ns
$t_{D(OFF)}$	Turn-Off Delay Time			28		ns
t_f	Turn-Off Fall Time			6		ns

- Repetitive rating, Pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$
- The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using $\leq 10s$ junction-to-ambient thermal resistance.
- The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any given application depends on the user's specific board design.
- The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.



P-Channel Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{GS} = \pm 10V, V_{DS} = 0V$			± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.45	0.6	-1.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance	$V_{GS} = -10V, I_D = -1.8A$		135	150	m Ω
		$V_{GS} = -4.5V, I_D = -1.3A$		140	160	m Ω
g_{FS}	Forward Transconductance	$V_{DS} = -5V, I_D = -1.0A$		15		S
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage	$V_{GS} = 0V, I_S = -1.0A$			-1.2	V
I_S	Maximum Body-Diode Continuous Current				-1.2	A
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS} = -10V, V_{GS} = 0V$ $f = 1.0MHz$		650		pF
C_{oss}	Output Capacitance			125		pF
C_{rss}	Reverse Transfer Capacitance			85		pF
Switching Characteristics						
Q_g	Total Gate Charge	$V_{DS} = -10V, I_D = -1.8A$ $V_{GS} = -6V$		10.5		nC
Q_{gs}	Gate-Source Charge			3.5		nC
Q_{gd}	Gate-Drain Charge			4.0		nC
$t_{D(ON)}$	Turn-On Delay Time	$V_{DD} = -10V, I_D = -1A$ $V_{GS} = -6V$ $R_{GEN} = 6\text{ ohm}$		7.5		ns
t_r	Turn-On Rise Time			4.5		ns
$t_{D(OFF)}$	Turn-Off Delay Time			45.5		ns
t_f	Turn-Off Fall Time			15		ns

- a. Repetitive rating, Pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$
- b. The power dissipation P_D is based on $T_{J(MAX)}=150^\circ\text{C}$, using $\leq 10s$ junction-to-ambient thermal resistance.
- c. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The value in any given application depends on the user's specific board design.
- d. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.



SOT23-8L Package Outline

