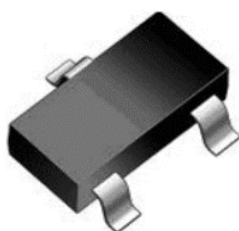


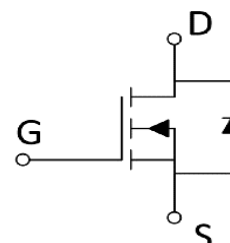
-60V_{DS} P-Channel Enhancement Mode MOSFET

Features

- $V_{DS}=-60V, I_D=-2A$
- $R_{DS(ON)}=190m\Omega$ (TYP.) $V_{GS}=10V$
- Reliable and Rugged
- Avalanche Rated
- Low On-Resistance

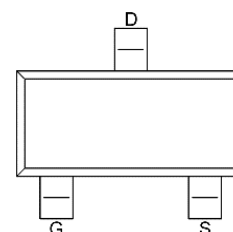


SOT-23



Applications

- Portable device
- Switch switching
- Load Switch
- Power management in portable/desktop PCs
- DC/DC conversion



Ordering Information

Device	Package		Marking	Package Qty.
HM2309	SOT-23	Pb-Free	S9	3000pcs/Reel

Absolute Maximum Ratings ($T_C=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS}=0V$)	V_{DS}	-60	V
Gate-Source Voltage ($V_{GS}=0V$, static)	V_{GS}	± 20	V
Continuous Drain Current ($T_C=25^{\circ}C$)	I_D	-2	A
Pulsed Drain Current	I_{DM}	-0.75	A
Maximum Power Dissipation	P_D	1.56	W
Operating, Storage Temperature Range	T_J, T_{STG}	-55~150	$^{\circ}C$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	-	40	-	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	-	80	-	$^{\circ}C/W$

Electrical Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	-60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=24V, V_{GS}=0V$	-	-	1	μA
Gate -Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.5	2.5	V
Drain-Source On-stage Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=2A$	-	145	190	m Ω
		$V_{GS}=4.5V, I_D=1.5A$	-	110	140	

Dynamic Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{iss}	$V_{DS}=15V$ $V_{GS}=0V$ $f=1MHz$	-	425	-	pF
Output capacitance	C_{oss}		-	35	-	
Reverse transfer capacitance	C_{rss}		-	20	-	
Gate Resistance	R_g	$f=1MHz$	-	17	-	Ω
Total Gate Charge	Q_g	$V_{DS}=15V$ $V_{GS}=4.5V$ $I_D=5.8A$	-	8.2	-	nC
Gate Source Charge	Q_{gs}		-	1.8	-	
Gate Drain Charge	Q_{gd}		-	1.5	-	
Turn-on delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=15V$ $R_L=2.7\Omega$ $R_G=3\Omega$	-	5.2	-	ns
Rise time	t_r		-	19	-	
Turn-off delay Time	$t_{d(off)}$		-	35	-	
Fall time	t_f		-	11	-	

Reverse Diode Characteristics

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Body Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=1A$	-	0.8	1	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, I_{SD}=5A$ $d_i/d_t=100A/\mu s$	-	16	-	ns
Reverse Recovery Charge	Q_{rr}		-	9	-	nC

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