

2304 N-Channel 30-V(D-S) MOSFET

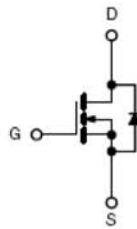
FEATURE

TrenchFET Power MOSFET

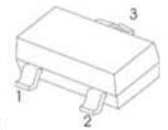
APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter

MARKING: S4



SOT-23



1. GATE
2. SOURCE
3. DRAIN

Maximum ratings ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	3.3	A
Pulsed Drain Current	I_{DM}	15	
Continuous Source-Drain Diode Current	I_S	0.9	
Maximum Power Dissipation	P_D	0.35	W
Thermal Resistance from Junction to Ambient ($t \leq 5s$)	$R_{\theta JA}$	357	$^{\circ}\text{C}/\text{W}$
Storage Temperature	T_J	150	$^{\circ}\text{C}$
Junction Temperature	T_{STG}	-55 ~ +150	

Electrical characteristics ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Gate-source threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2		2.2	
Gate-body leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 30V, V_{GS} = 0V$			1	μA
Drain-source on-state resistance ^a	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 3.2A$		0.049	0.060	Ω
		$V_{GS} = 4.5V, I_D = 2.8A$		0.061	0.075	
Forward transconductance ^a	g_{fs}	$V_{DS} = 4.5V, I_D = 2.5A$	3			S
Dynamic^b						
Total gate charge	Q_g	$V_{DS} = 15V, V_{GS} = 10V, I_D = 3.4A$		4.5	6.7	nC
				2.1	3.2	
Gate-source charge	Q_{gs}	$V_{DS} = 15V, V_{GS} = 4.5V, I_D = 3.4A$		0.85		nC
Gate-drain charge	Q_{gd}			0.65		
Gate resistance	R_g	$f = 1.0\text{MHz}$	0.8	4.4	8.8	Ω
Input capacitance	C_{iss}	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$		235		pF
Output capacitance	C_{oss}			45		
Reverse transfer capacitance	C_{rss}			17		
Turn-on delay Time	$t_{d(on)}$	$V_{DD} = 15V,$ $R_L = 5.6\Omega, I_D \approx 2.7A,$ $V_{GEN} = 4.5V, R_g = 1\Omega$		12	20	ns
Rise time	t_r			50	75	
Turn-off delay time	$t_{d(off)}$			12	20	
Fall time	t_f			22	35	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 15V,$ $R_L = 5.6\Omega, I_D \approx 2.7A,$ $V_{GEN} = 10V, R_g = 1\Omega$		5	10	ns
Rise time	t_r			12	20	
Turn-off delay time	$t_{d(off)}$			10	15	
Fall time	t_f			5	10	
Drain-source body diode characteristics						
Continuous source-drain diode current	I_S	$T_C = 25^\circ\text{C}$			1.4	A
Pulse diode forward current	I_{SM}				15	
Body diode voltage	V_{SD}	$I_S = -2.7A, V_{GS} = 0V$		0.8	1.2	V

Notes :

- a. Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.