

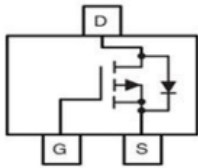
P-Channel Enhancement MOSFET Transistor

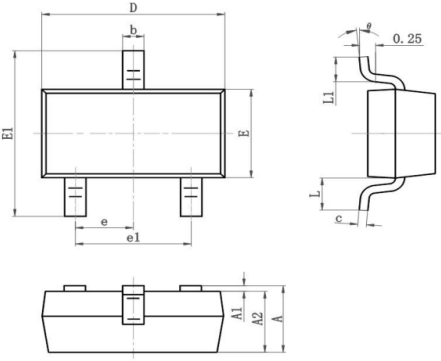
Primary characteristics			
Symbol	Parameter	Value	Unit
I_D	Drain current (continuous) at $T_A=25^\circ\text{C}$	-2	A
BV_{DS}	Drain-source voltage	-60	V
P_D	Total device dissipation at $T_A=25^\circ\text{C}$	1500	mW

Features

- SOT-23 case for easy automatic insertion
- Pb-free and RoHS compliant

Pinning



Case dimensions				
				
SOT-23				
Symbol	Dimensions in millimeters		Dimensions in inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.050	0.055
E1	2.250	2.550	0.089	0.100
e	0.900	1.000	0.035	0.039
e1	1.800	2.000	0.071	0.079
L	0.500	0.600	0.020	0.024
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Absolute maximum ratings

Characteristic	Symbol	Value	Unit
Drain-source voltage	BV_{DS}	-60	V
Gate-source voltage	V_{GS}	± 20	V
Drain current (continuous) at $T_A=25^\circ\text{C}$	I_D	-2	A
Drain current (pulsed)	I_{DM}	-8	A
Total device dissipation at $T_A=25^\circ\text{C}$	P_D	1500	mW
Thermal resistance junction-ambient	$R_{\theta JA}$	83	$^\circ\text{C/W}$
Junction/storage temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

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

Characteristic	Test condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Drain-source breakdown voltage	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	BV_{DSS}	-60	-	-	V
Zero gate voltage drain current	$V_{DS}=-60\text{V}$, $V_{GS}=0\text{V}$	I_{DSS}	-	-	1	μA
Gate-body leakage current	$V_{DS}=0\text{V}$, $V_{GS}=\pm 20\text{V}$	I_{GSS}	-	-	± 100	nA
Gate threshold voltage	$V_{DS}=V_{GS}$, $I_D=-250\mu\text{A}$	$V_{GS(th)}$	-1	-1.65	-2.4	V
Static drain-source on-state resistance	$V_{GS}=-10\text{V}$, $I_D=-1.5\text{A}$	$R_{DS(ON)}$	-	168	220	m Ω
	$V_{GS}=-4.5\text{V}$, $I_D=-1.5\text{A}$		-	185	270	
Diode forward voltage drop	$V_{GS}=0\text{V}$, $I_{SD}=-1.5\text{A}$	V_{SD}	-	-	-1.2	V

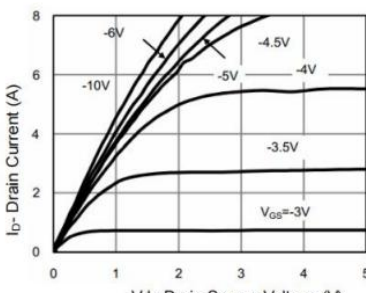
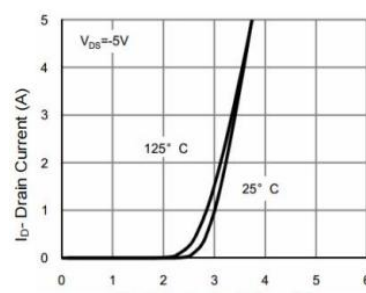
Dynamic electrical characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

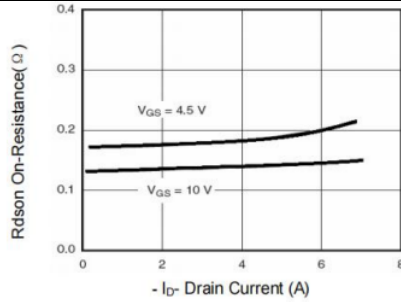
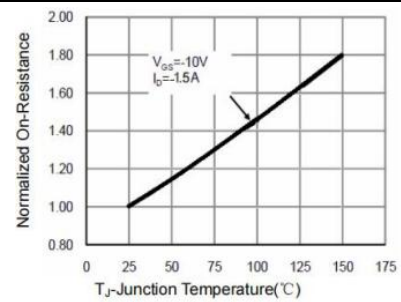
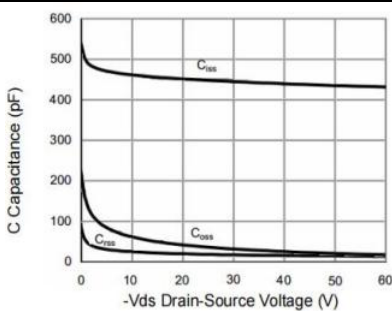
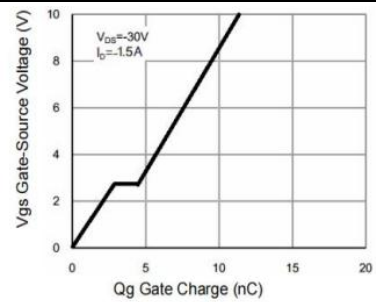
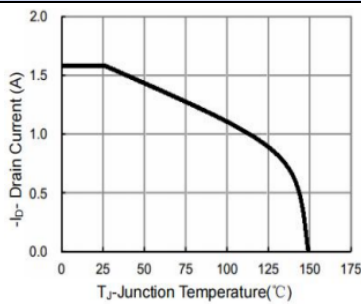
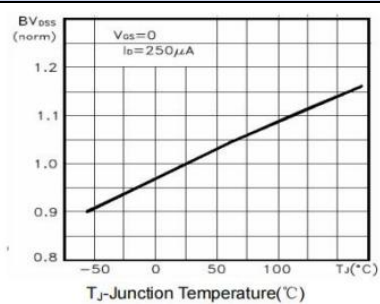
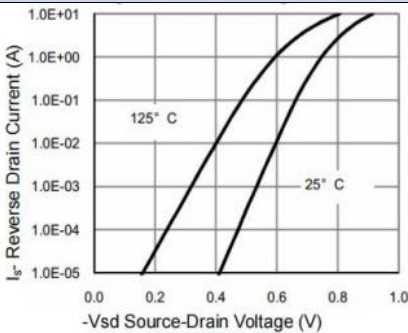
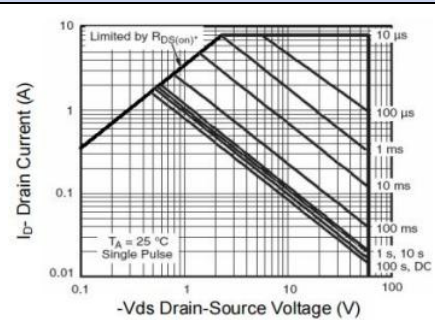
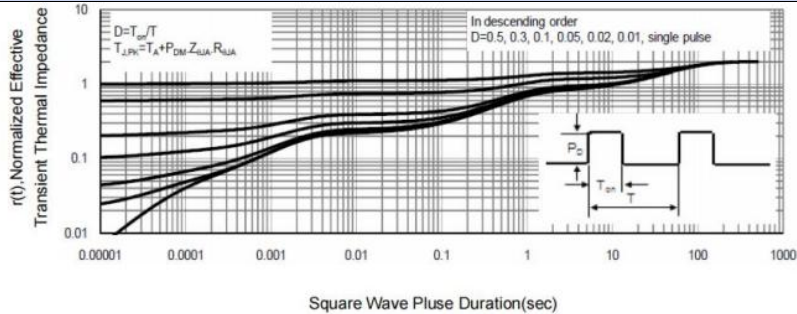
Characteristic	Test condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Input capacitance	$V_{DS}=-30\text{V}$ $V_{GS}=0\text{V}$ $f=1\text{MHz}$	C_{ISS}	-	450	-	pF
Common source output capacitance		C_{OSS}	-	20	-	pF
Reverse transfer capacitance		C_{RSS}	-	18	-	pF
Total Gate Charge	$V_{DS}=-30\text{V}$ $V_{GS}=-10\text{V}$ $I_D=-1.5\text{A}$	Q_g	-	11	-	nC
Gate Source Charge		Q_{gs}	-	3	-	nC
Gate Drain Charge		Q_{gd}	-	2	-	nC

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

Characteristic	Test condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Turn-ON delay time	$V_{DS}=-30\text{V}$ $V_{GS}=-10\text{V}$ $R_{GEN}=3\Omega$ $I_D=-1.5\text{A}$	$t_{d(on)}$	-	40	-	ns
Turn-ON rise time		t_r	-	35	-	ns
Turn-OFF delay time		$t_{d(off)}$	-	15	-	ns
Turn-OFF fall time		t_f	-	10	-	ns

Typical characteristic curves

Output characteristics	Transfer characteristics
	

On-resistance vs. Drain current

On-resistance vs. Temperature

Capacitance characteristics

Gate-charge characteristics

Drain current vs. Temperature

Power Dissipation

Body diode characteristics

Safe operating area

Transient thermal response curve


Ordering information			
Part Number	Package	Shipping Quantity	Dimensions
AK2309M	SOT-23	3 000 pcs / reel	---

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