

N-Channel Enhancement Mode MOSFET

Primary characteristics			
Symbol	Parameter	Value	Unit
I_D	Continuous drain current (@ $T_a=25^\circ\text{C}$)	6.2	A
V_{DS}	Drain source voltage	20	V
$R_{DS(on)}$ @ $V_{GS}=4.5\text{V}$, $I_D=4.5\text{A}$	Static drain-source on-resistance	<25 Typ. 19.4	m Ω

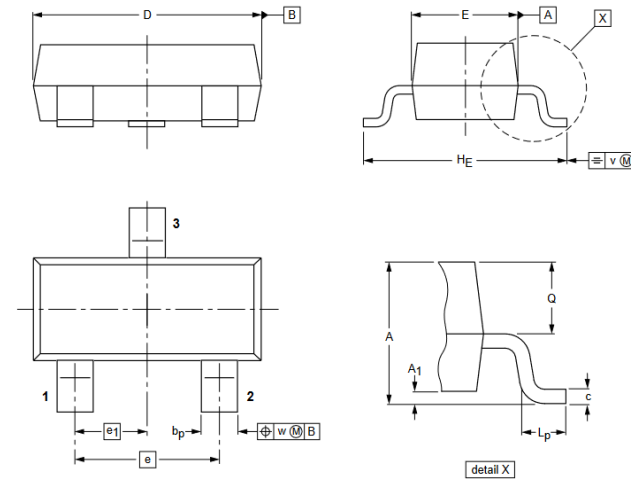
Features

- **SOT-23** case for easy automatic insertion
- Pb-free and **RoHS** compliant
- Advanced trench process technology
- High density cell design for ultra low on-resistance

Application

- Load switch
- DC/DC converter
- Switching circuits
- Power management

Case dimensions



1 – Gate; 2 – Source; 3 - Drain

SOT-23 (TO-236AB)

Unit	A	A _{1max}	b _p	c	D	E	e	e ₁	H _E	L _p	Q	v	w
mm	1.0 ±0.1	0.1	0.43 ±0.05	0.12 ±0.03	2.9 ±0.1	1.3 ±0.1	1.9	0.95	2.3 ±0.2	0.3 ±0.15	0.5 ±0.05	0.2	0.1

Absolute maximum ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

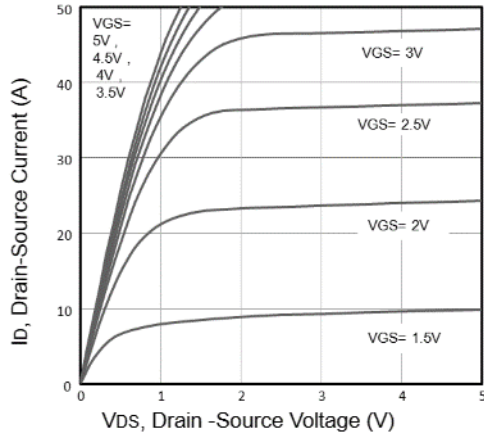
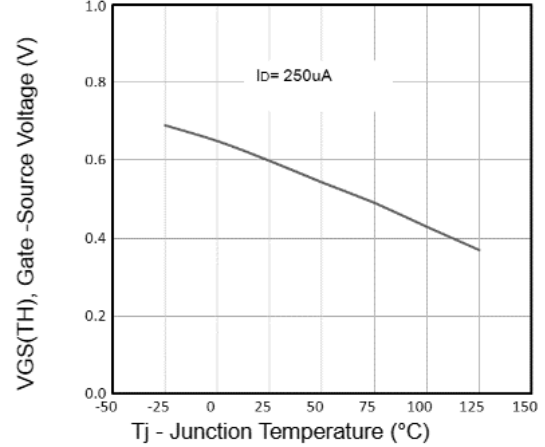
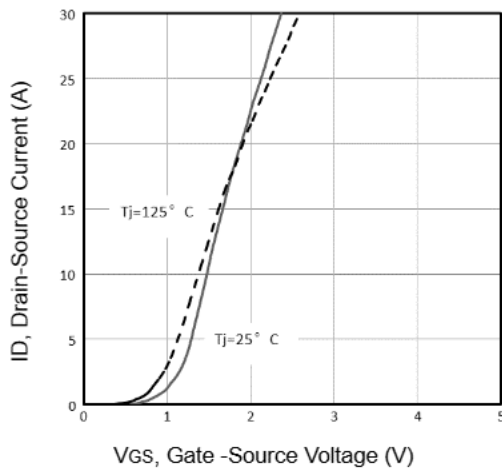
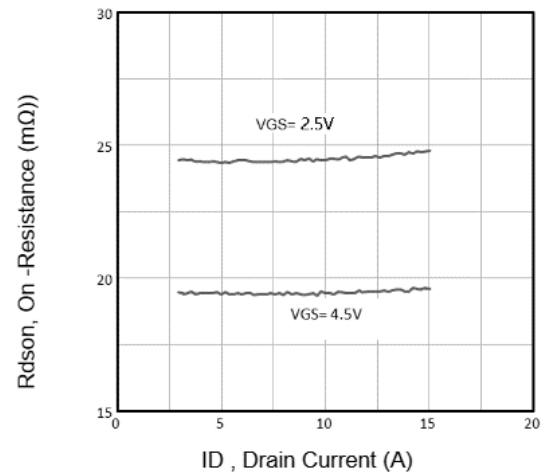
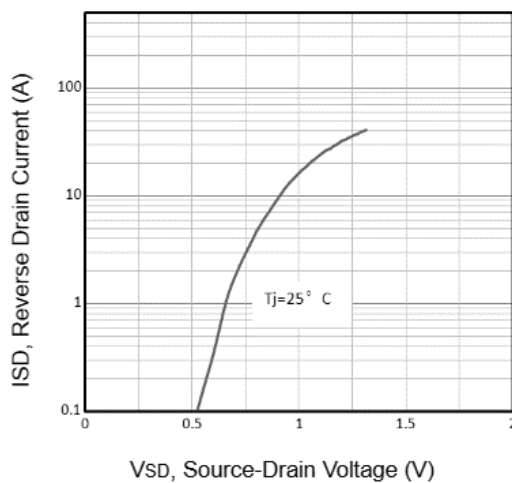
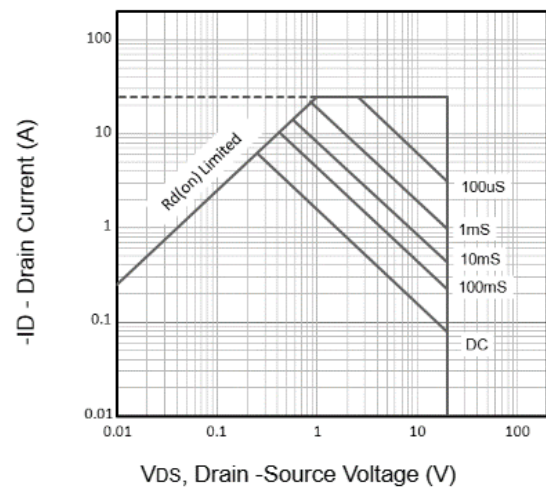
Characteristic	Symbol	Value	Unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	±12	V
Continuous drain current	I_D	6.2	A
Pulsed drain current ¹⁾	I_{DM}	24.8	A
Power Dissipation ²⁾	P_D	1.56	W
Operating junction temperature range	T_J, T_{STG}	-50 ~ 175	°C
Thermal resistance junction-ambient ²⁾	$R_{\theta JA}$	80	°C/W

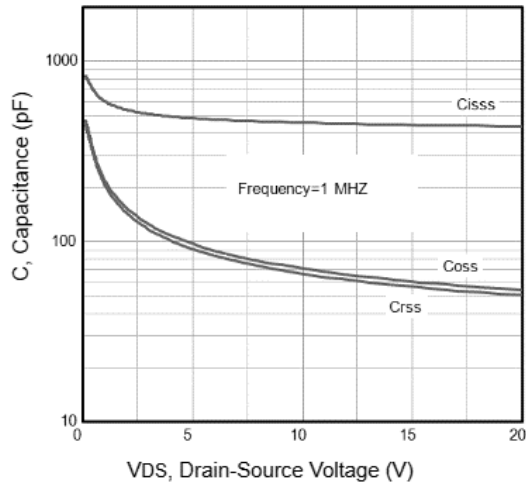
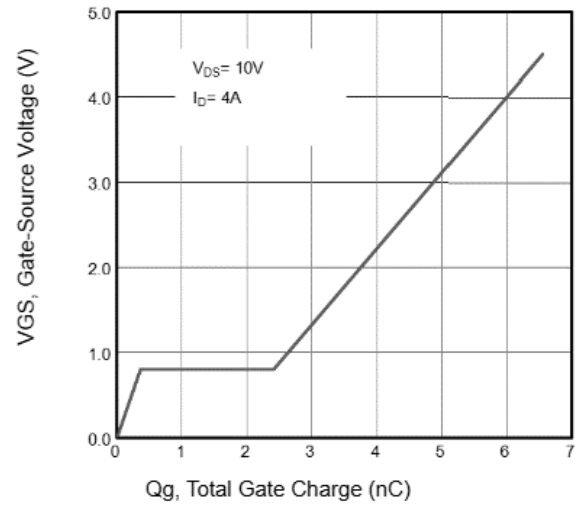
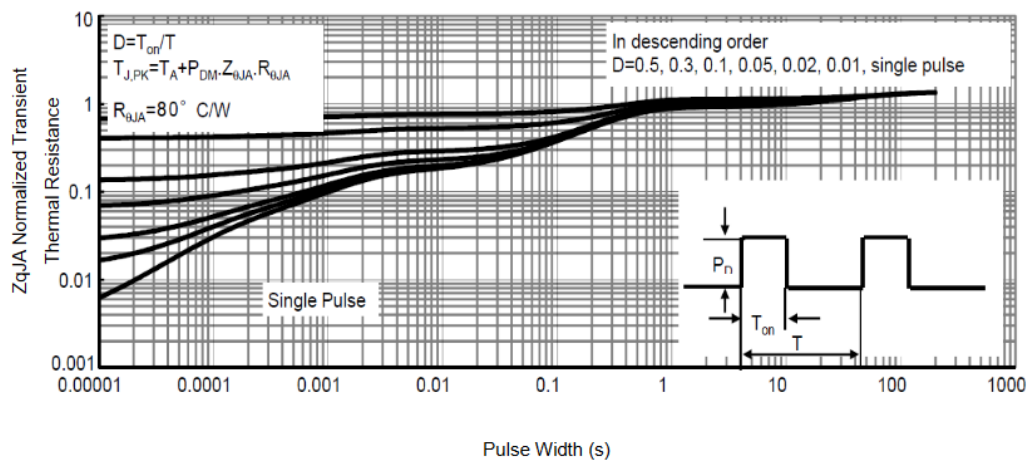
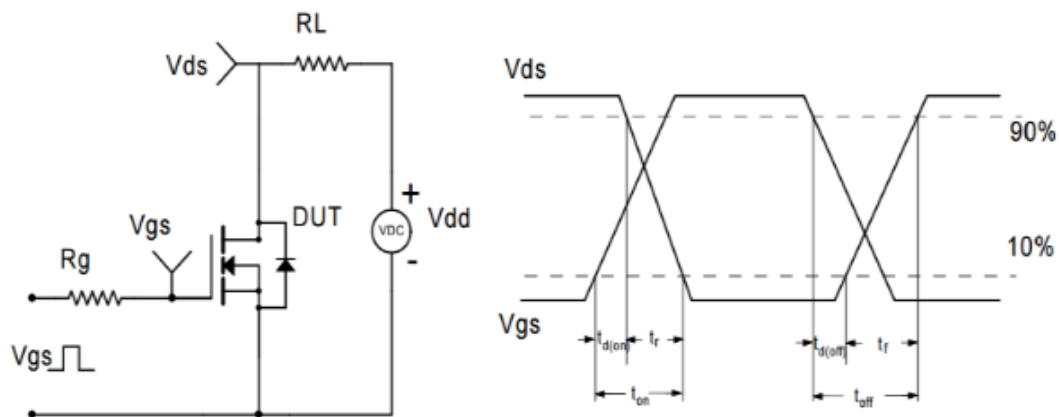
Electrical characteristics (T _A = 25°C)						
Characteristic	Test condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Drain-source breakdown voltage	V _{GS} =0V, I _D =250μA	V _{(BR)DSS}	20	-	-	V
Drain-source leakage current	V _{DS} =20V, V _{GS} =0V	I _{DSS}	-	-	1.0	μA
Gate-source leakage current	V _{GS} =±10V, V _{DS} =0V	I _{GSS}	-	-	±100	nA
Gate threshold voltage	V _{DS} =V _{GS} , I _D =250μA	V _{GS(TH)}	0.45	0.6	1.0	V
Drain-source on-state resistance ³⁾	V _{GS} =4.5V, I _D =4.5A	R _{DS(ON)}	-	19.4	25	mΩ
	V _{GS} =2.5V, I _D =2.0A		-	21.5	28	mΩ
Dynamic electrical characteristics						
Characteristic	Test condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Input capacitance	V _{DS} =10V V _{GS} =0V f=1.0MHz	C _{iss}	-	457	-	pF
Output capacitance		C _{oss}	-	71	-	pF
Reverse transfer capacitance		C _{rss}	-	66	-	pF
Total gate charge	V _{DS} =10V V _{GS} =4.5V I _D =4.0A	Q _g	-	6.6	-	nC
Gate source charge		Q _{GS}	-	0.4	-	nC
Gate drain charge		Q _{gd}	-	2.0	-	nC
Switching characteristics						
Characteristic	Test condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Turn on delay time	V _{DS} =10V V _{GS} =4.5V I _D =1.0A R _G =3.3Ω	t _{d(on)}	-	4.1	-	ns
Turn on rise time		t _r	-	11.6	-	ns
Turn off delay time		t _{d(off)}	-	24	-	ns
Turn off fall time		t _f	-	7.6	-	ns
Source drain diode characteristics						
Characteristic	Test condition	Symbol	Value			Unit
			Min.	Typ.	Max.	
Source drain current (body diode)	T _A =25°C	I _{SD}	-	-	0.2	A
Drain-source diode forward voltage	I _S =4.0A, V _{GS} =0V	V _{SD}	-	0.79	1.2	V

Notes:

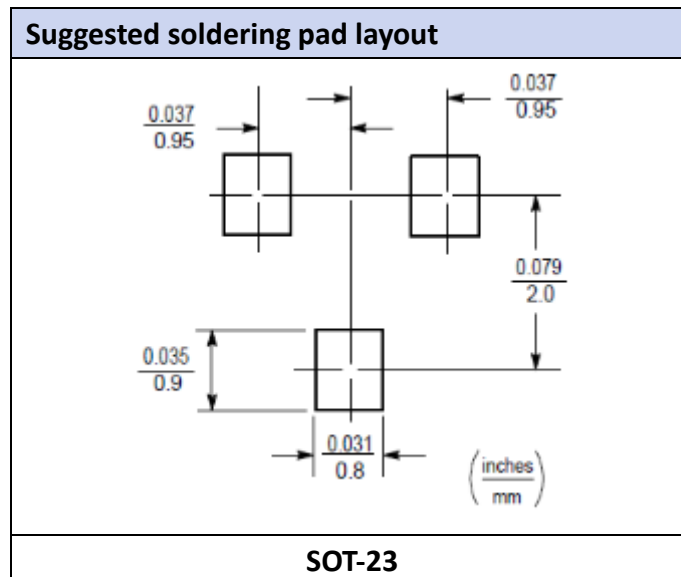
- 1) Pulse width limited by maximum allowable junction temperature
- 2) The value of P_D&R_{θJA} is measured with the device mounted on 1 in² FR-4 board with 2oz. copper, double sided, in a still air environment with T_a=25°C
- 3) Pulse test; pulse width≤300μs, duty cycle≤2%

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

Typical characteristics
Typical output characteristics

 $V_{GS(TH)}$ voltage vs. temperature

Typical transfer characteristics

On-resistance vs. drain current and gate voltage

Typical source-drain diode forward voltage

Maximum safe operating area


Typical characteristics
Typical capacitance vs. drain-source voltage

Typical gate charge vs. gate-source voltage

Normalized maximum transient thermal impedance

Switching time test circuit and waveforms


Ordering information			
Part Number	Package	Shipping Quantity	Dimensions
AKS2300	SOT-23	3000 pcs / reel	---



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