★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

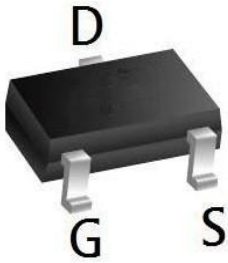
Product Summary

BVDSS	RDSON	ID
-60V	160 mΩ	-2 A

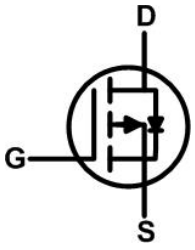
Description

The ZX 2309 is the high cell density trenched P-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications.
The ZX 2309 meet the RoHS and Green Product requirement with full function reliability approved.

SOT23 Pin Configurations



pin assignment



Schematic diagram

Package Marking and Ordering Information

Product	Package	Marking	Packing	Min Unit Quantity
ZX 2309	SOT23	*	3000PCS/Reel	3000PCS

Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Drain-Source voltage	V_{DS}	-60	V
Gate-Source voltage	V_{GS}	±20	
Continuous Drain Current	I_D	-2.0	A
Pulsed Drain Current[1]	I_{DM}	-5.2	A
Power Dissipation	P_D	1	W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55~ 150	℃
Thermal Resistance from Junction to Ambient[2]	$R_{\theta JA}$	125	°C/W

Electrical Characteristics (T =25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-60	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current(T_A=25℃)	V_{DS}=-60V, V_{GS}=0V	--	--	-1	μA
	Zero Gate Voltage Drain Current(T_A=125℃)	V_{DS}=-60V, V_{GS}=0V	--	--	-100	uA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=-250μA	-1.0	-1.5	-2.5	V
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-10V, I_D=-2A	--	160	200	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance②	V_{GS}=-4.5V, I_D=-1A	--	200	300	mΩ
Dynamic Electrical Characteristics @ T_J = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=-30V, V_{GS}=0V, f=1MHz	--	310	--	pF
C_{oss}	Output Capacitance		--	22	--	pF
C_{rss}	Reverse Transfer Capacitance		--	15	--	pF
Q_g	Total Gate Charge	V_{DS}=-30V I_D=-2A, V_{GS}=-10V	--	5.4	--	nC
Q_{gs}	Gate Source Charge		--	1.1	--	nC
Q_{gd}	Gate Drain Charge		--	1.6	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn on Delay Time	V_{DD}=-30V, I_D=-2A, R_G=3.3Ω, V_{GS}=-10V	--	41	--	ns
t_r	Turn on Rise Time		--	22	--	ns
$t_{d(off)}$	Turn Off Delay Time		-	25	--	ns
t_f	Turn Off Fall Time		--	32	--	ns
Source Drain Diode Characteristics						
I_{SD}	Source drain current(Body Diode)	T_A=25℃	--	--	-2.0	A
V_{SD}	Forward on voltage②	T_j=25℃, I_{SD}=-2A, V_{GS}=0V	--	-0.84	-1.2	V

Notes:

① Pulse width limited by maximum allowable junction temperature

②Pulse test ; Pulse width≤300μs, duty cycle≤2%.

Typical Characteristics

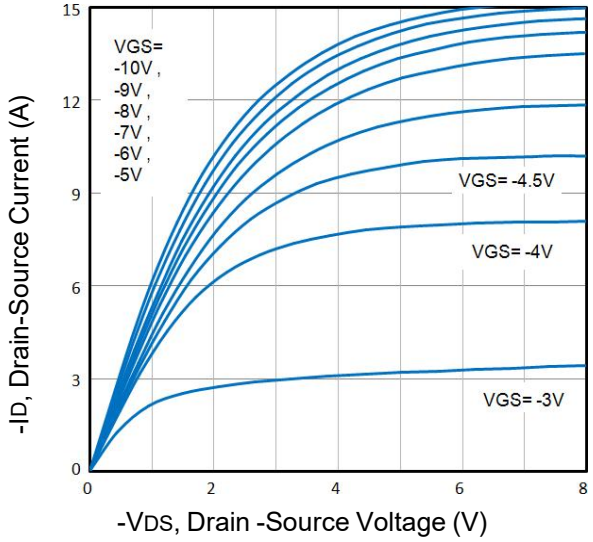


Fig1. Typical Output Characteristics

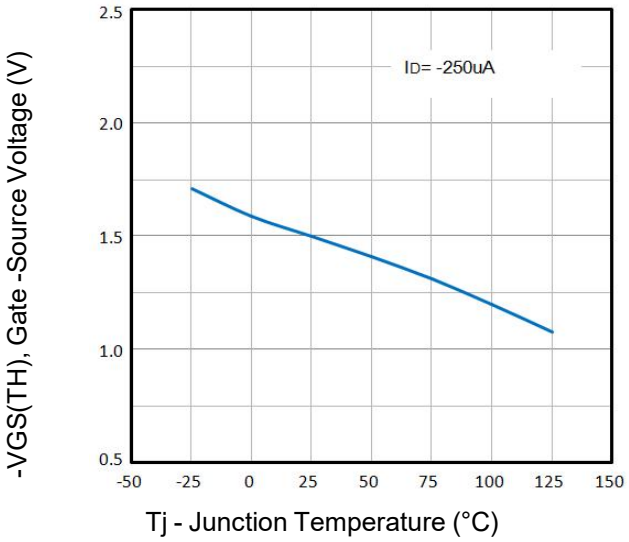


Fig2. Normalized Threshold Voltage Vs. Temperature

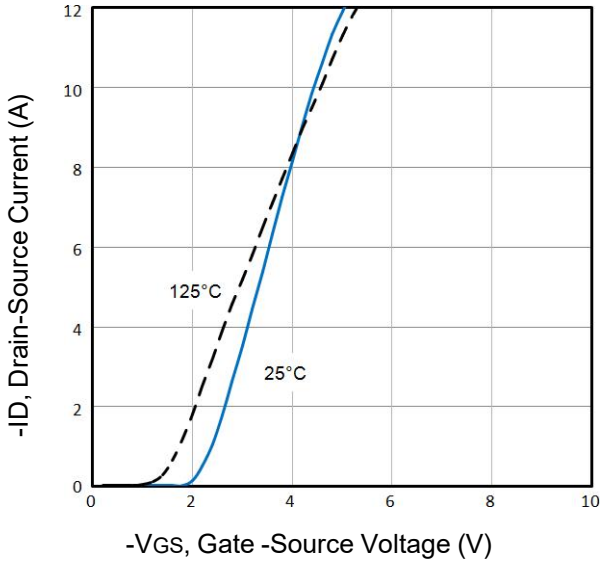


Fig3. Typical Transfer Characteristics

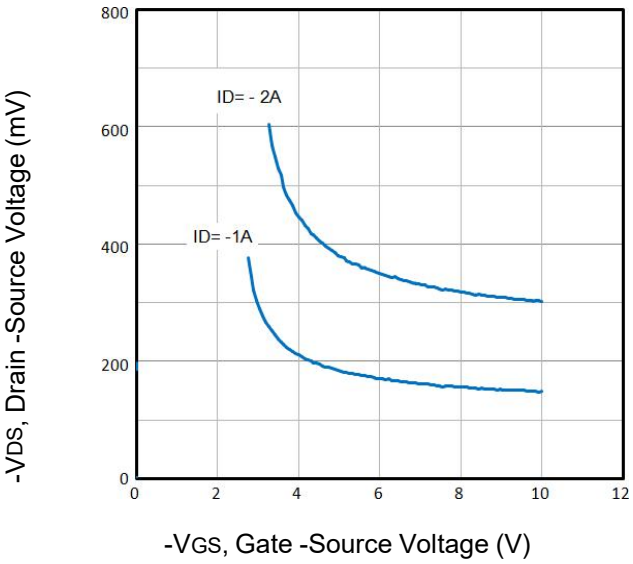


Fig4. Drain -Source Voltage vs Gate -Source Voltage

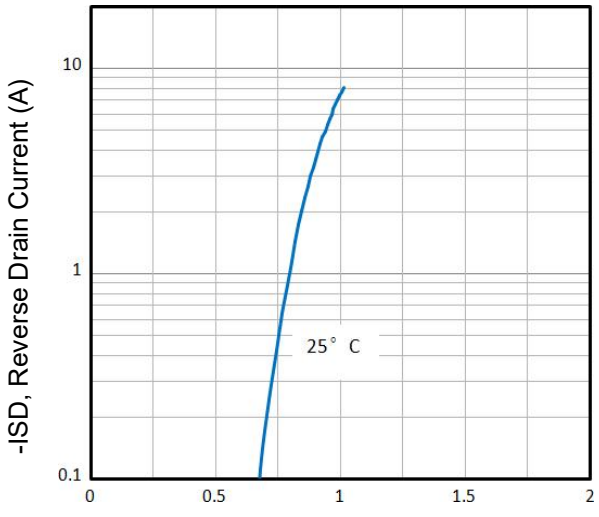


Fig5. Typical Source-Drain Diode Forward Voltage

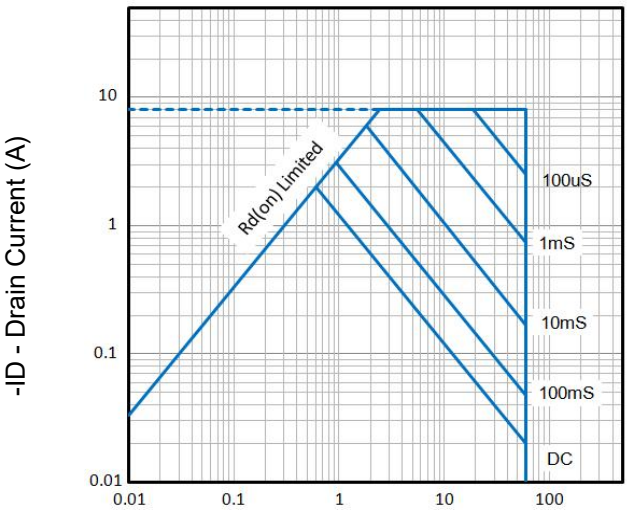


Fig6. Maximum Safe Operating Area

Typical Characteristics

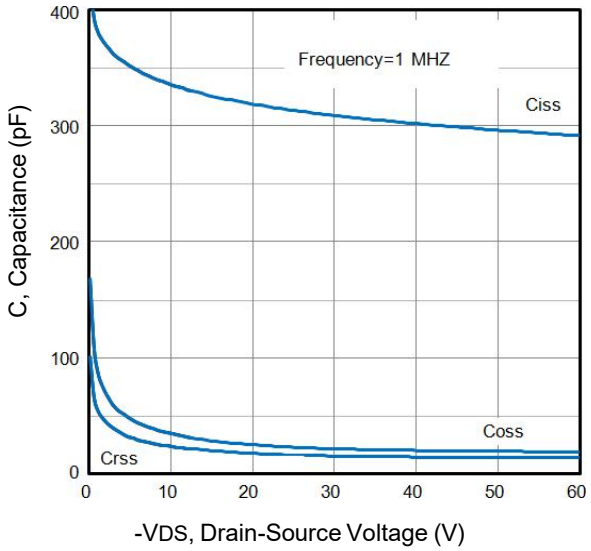


Fig7. Typical Capacitance Vs. Drain-Source Voltage

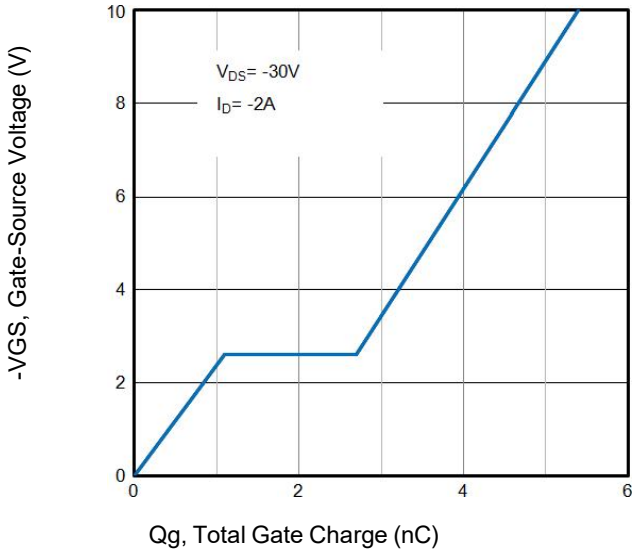


Fig8. Typical Gate Charge Vs. Gate-Source Voltage

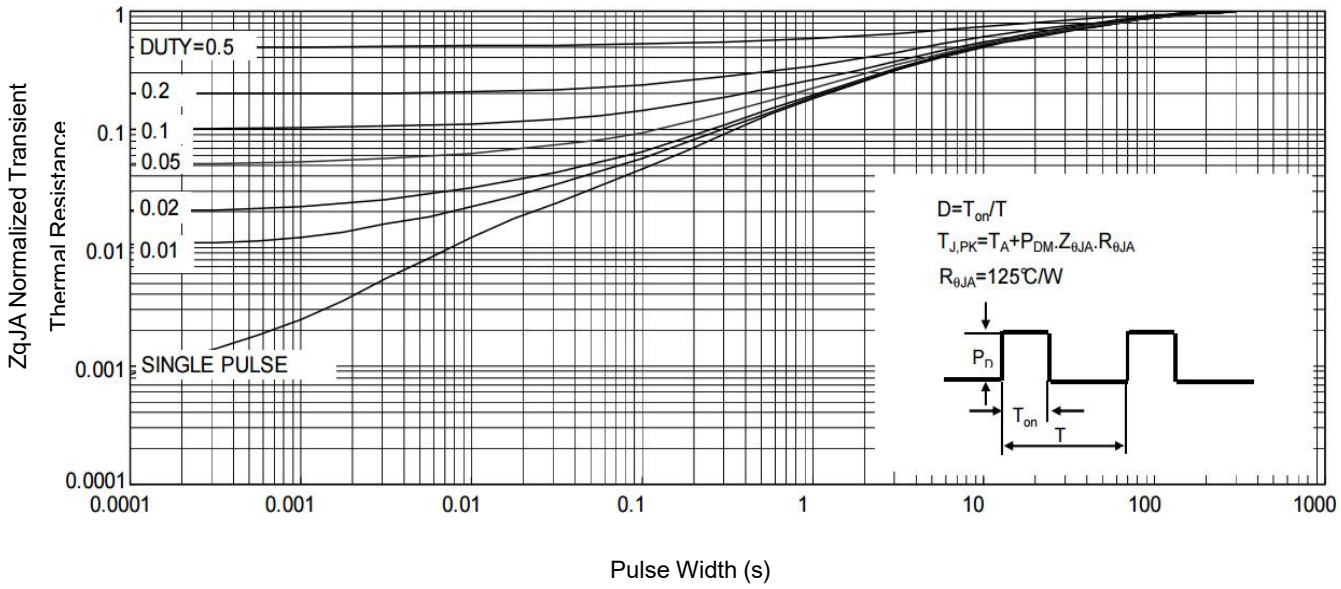


Fig9. Normalized Maximum Transient Thermal Impedance

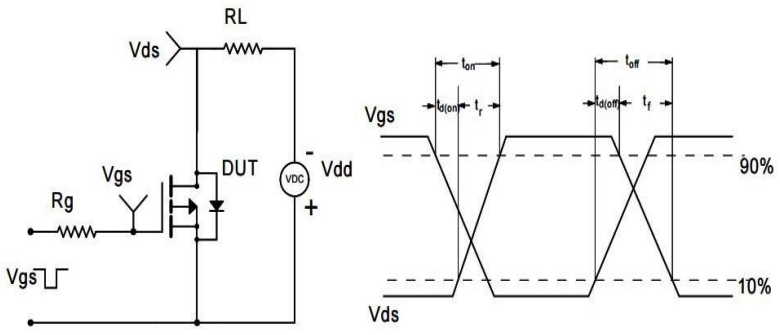
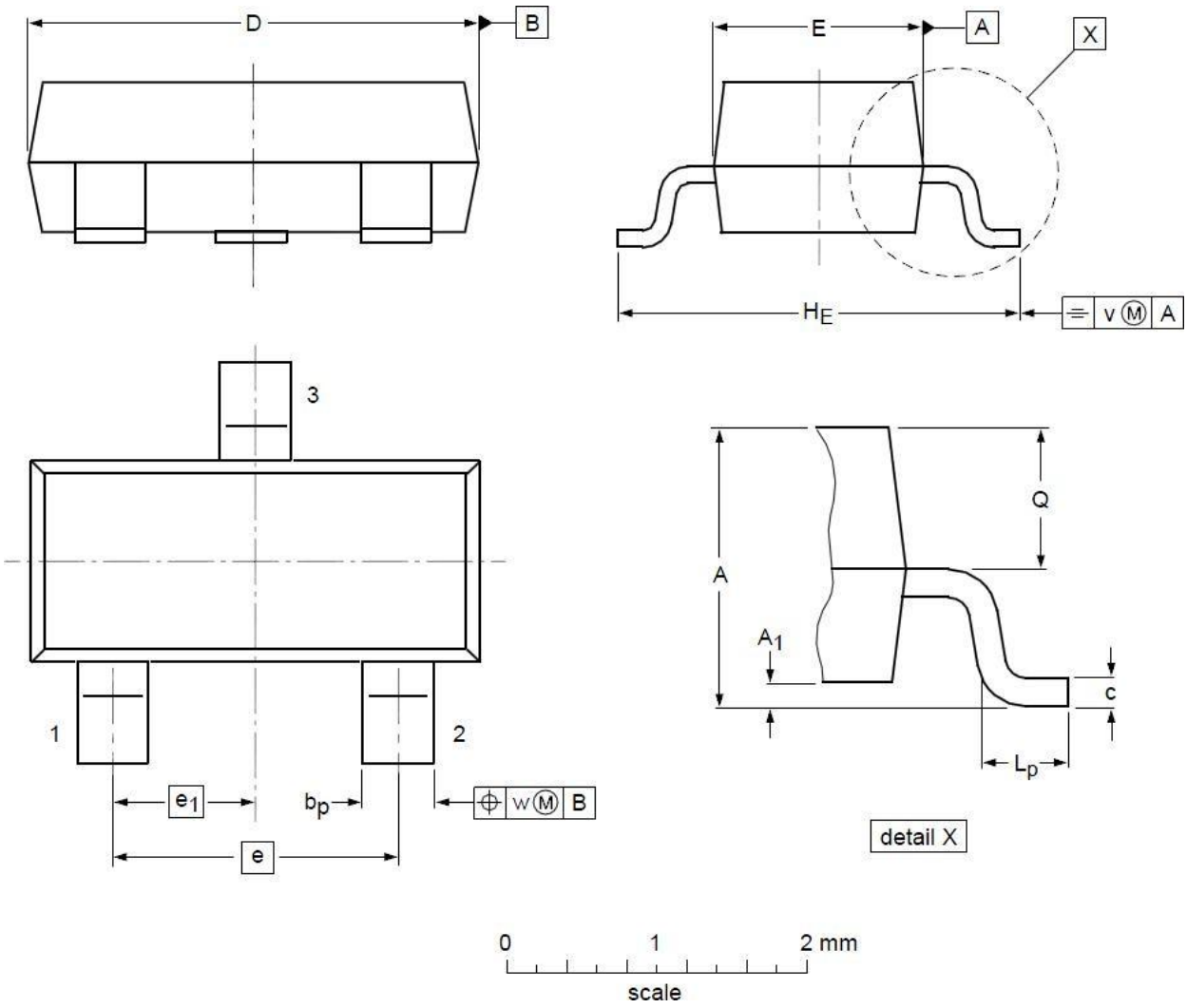


Fig10. Switching Time Test Circuit and waveforms

Package Mechanical Data-SOT-23



DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	**A_1**	0.01	0.05	0.10
b_p	0.30	0.42	0.50	**c**	0.08	0.13	0.15
D	2.80	2.92	3.00	**E**	1.20	1.33	1.40
e	--	1.90	--	**e_1**	--	0.95	--
H_E	2.25	2.40	2.55	**L_p**	0.30	0.42	0.50
Q	0.45	0.49	0.55	**v**	--	0.20	--
w	--	0.10	--				