WANSEMI
万代半导体

WP2309

Enhancement Mode P-Channel Power MOSFET

SOT23/PMOS/-60V/±20V/-2V/-2A/140mΩ

Rev1.1

P Channel Advanced Power MOSFET

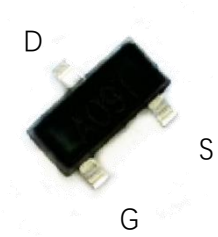
1.Features

- Fast Switching
- Improved dv/dt Capability

V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
-60V	140mΩ @ 10V	-2A

2.Applications

- Load Switch
- PWM Application
- Power management



Pin Description

SOT23

Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP2309	N9	SOT23	3,000	180,000

4.Absolute Max Ratings at Ta=25℃ (Note1)

Parameter	Symbol	Value	Units
Drain to Source Voltage	V_{DS}	-60	V
Gate to Source Voltage	V_{GS}	±20	V
Drain Current (DC)	I_D	-2	A
Drain Current (Pulse), PW≤300μs	I_{DP}	-8	A
Total Dissipation	P_D	1	W
Junction Temperature	T_j	150	℃
Storage Temperature	T_{stg}	-55 to +150	℃

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

5.Thermal Resistance Ratings

Parameter	Symbol	Value	Unit
Junction to ambient	$R_{\theta JA}$	125	℃/W

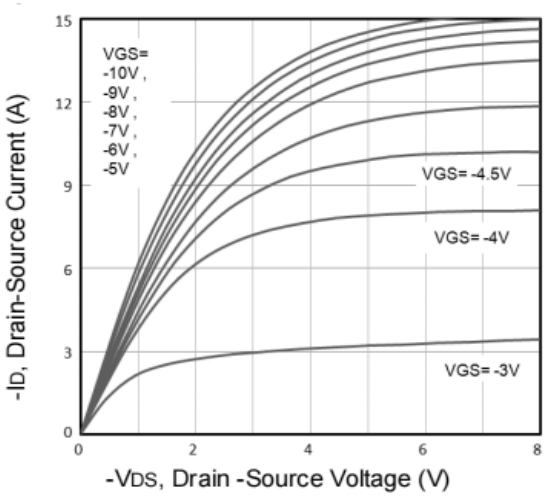
Note 2：When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

6.Electrical Characteristics at Ta=25℃ (Note 3)

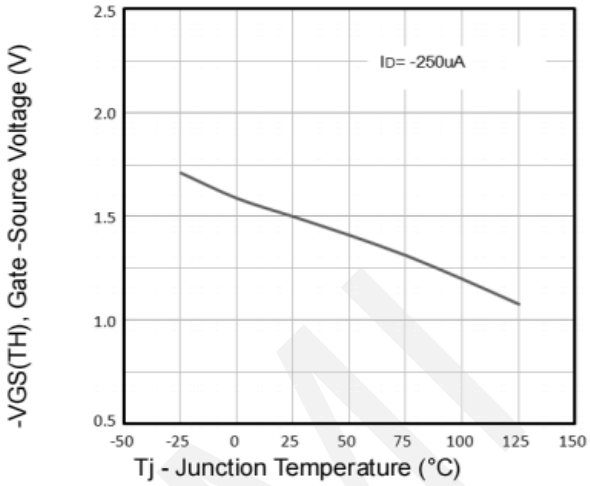
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0V	-60			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = -60V， V_{GS} = 0V			-1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	-1.4	-2.0	-2.6	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D = -2A, V_{GS} = -10V	-	140	190	mΩ
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-30V, Frequency=1.0MHz		310		pF
Output Capacitance	C_{oss}			22		pF
Reverse Transfer Capacitance	C_{rss}			15		pF
Turn-ON Delay Time	$t_{d(on)}$	I_D = -2A, V_{DS} =-30V, R_{GEN}= 3.3Ω, V_{GS} =-10V,		41		ns
Rise Time	t_r			22		ns
Turn-OFF Delay Time	$t_{d(off)}$			25		ns
Fall Time	t_f			32		ns
Total Gate Charge	Q_g	V_{DS} = -30V, V_{GS} =-10V, I_D = -2A		5.4		nC
	Q_{gs}			1.1		nC
	Q_{gd}			1.6		nC
Diode Forward Voltage	V_{FSD}	I_{SD} = -2A,V_{GS} =0V		-0.8	-1.2	V

Note 3：Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

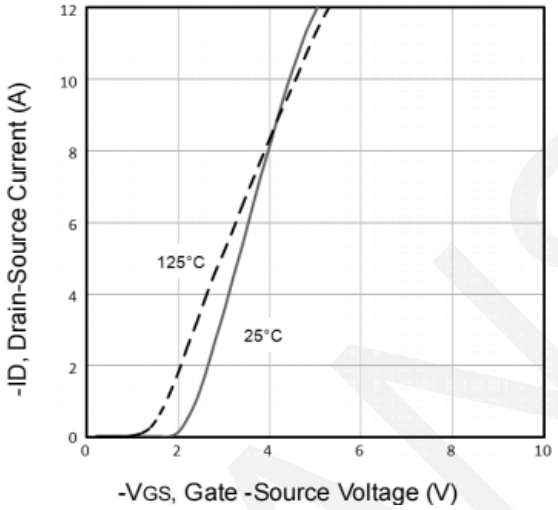
7.Typical electrical and thermal characteristics



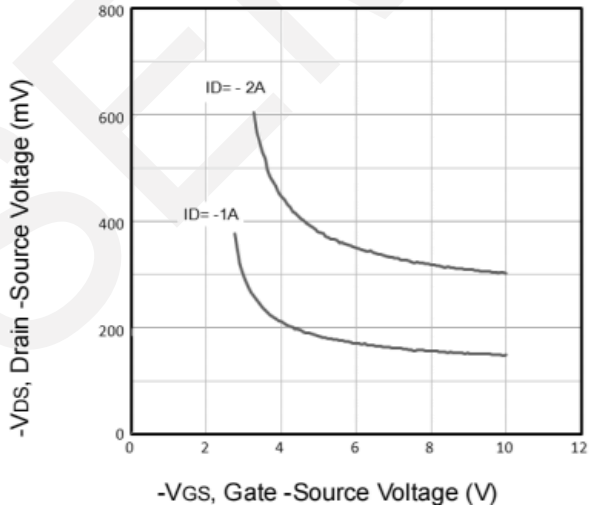
Output Characteristics



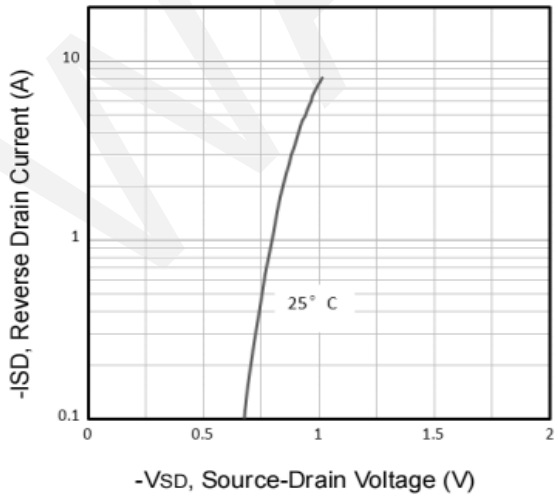
Normalized Threshold Voltage Vs. Temperature



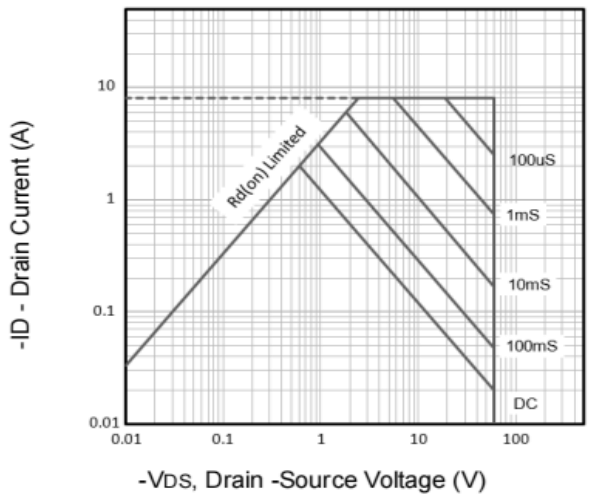
Typical Transfer Characteristics



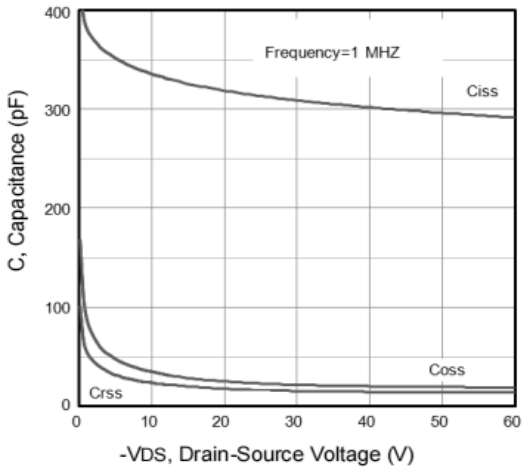
Drain -Source Voltage vs Gate -Source Voltage



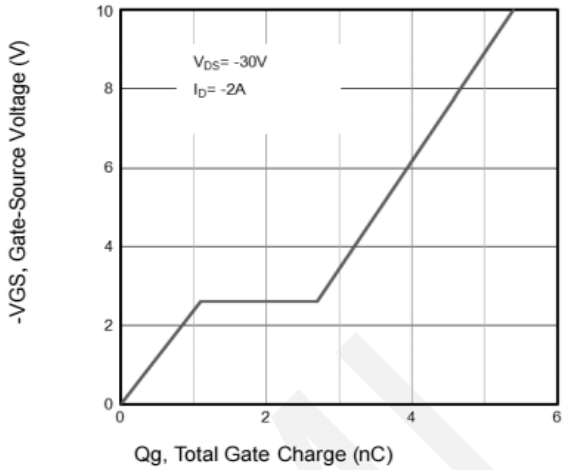
Typical Source-Drain Diode Forward Voltage



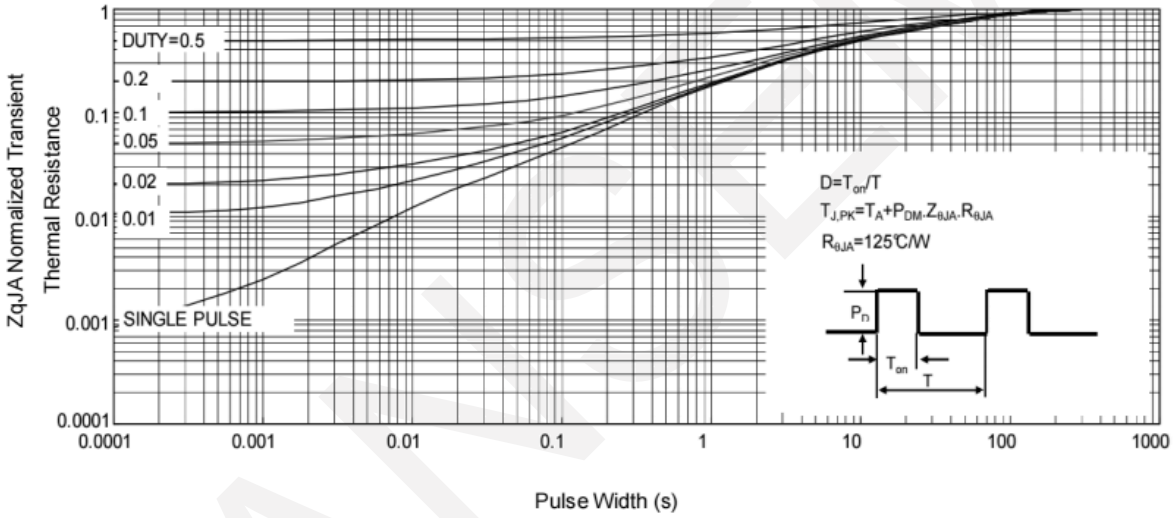
Maximum Safe Operating Area



Typical Capacitance Vs. Drain-Source Voltage

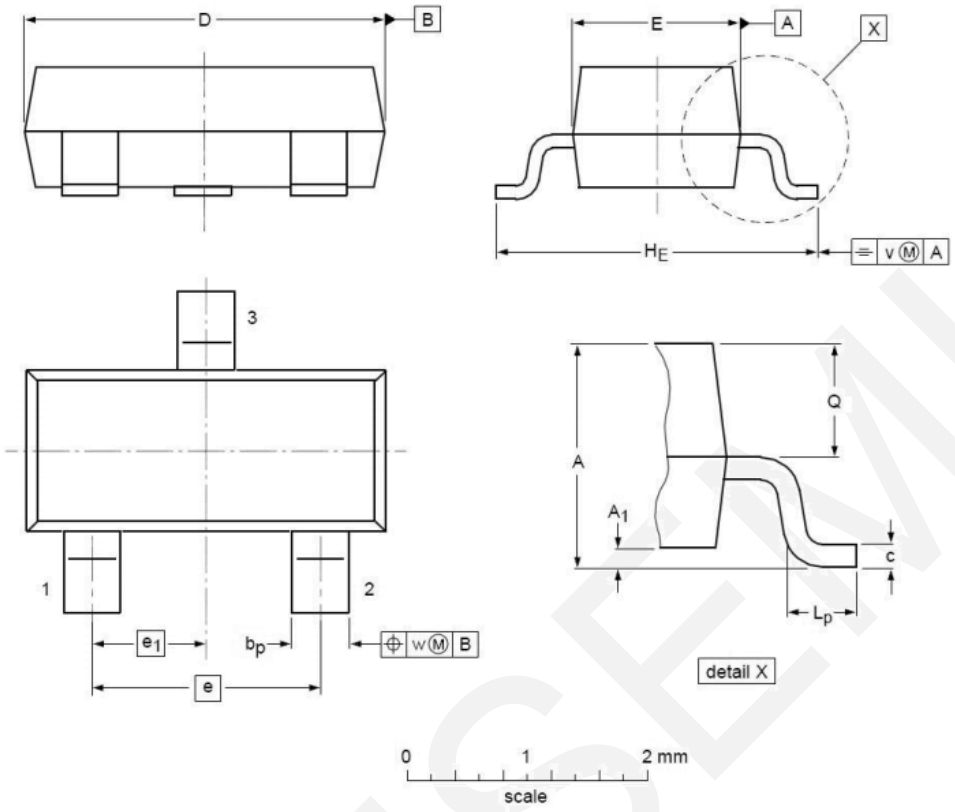


Typical Gate Charge Vs. Gate-Source Voltage



Normalized Maximum Transient Thermal Impedance

8.Package Dimensions



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	--				

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