WANSEMI
万代半导体

WP2301BSM

Enhancement Mode P-Channel Power MOSFET

SOT323/PMOS/-20V/±12V/-0.7V/-3.2A/50mΩ

Rev0.1



-20V, 50mΩ, -3.2A, P-Channel MOSFET

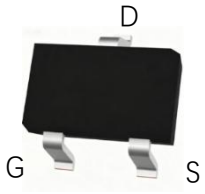
1.Features

- Advanced Trench Technology
- Surface mount package

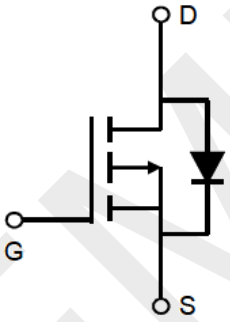
V_{DS}	$R_{DS(on)}$ Typ.	I_D.
-20V	50mΩ @ -4.5V	-3.2A
	60mΩ @ -2.5V	

2.Applications

- Power Management
- Load Switching



SOT323
Pin Description



Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP2301BSM	2301B	SOT323	3,000	180,000

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

Parameter	Symbol	Maximum	Units
Drain to Source Voltage	V_{DSS}	-20	V
Gate to Source Voltage	V_{GSS}	±12	V
Drain Current (DC)	I_D	-3.2	A
Drain Current (Pulse), PW≤300μs	I_{DP}	-12.8	A
Total Dissipation	P_D	1.0	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(Note 2)

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

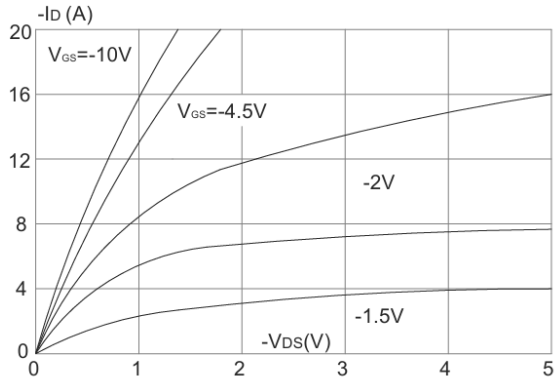
Note 2：When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

5.Electrical Characteristics at Ta=25℃ (Note 2)

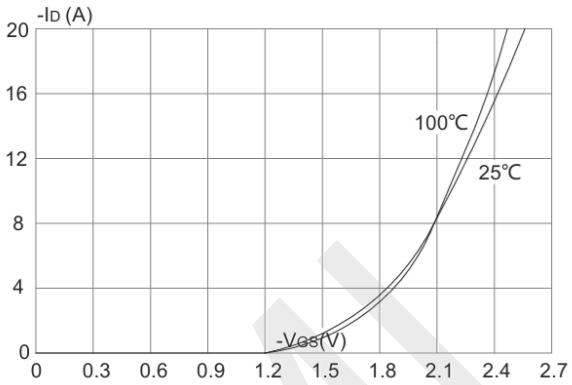
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = -250μA, V_{GS} = 0V	-20	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20V, V_{GS} = 0V	-	-	-1	uA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±12V, V_{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-0.3	-0.7	-1.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D =-3A, V_{GS} =-4.5V	-	50	64	mΩ
		I_D =-2A, V_{GS} = -2.5V	-	60	80	mΩ
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-10V, Frequency=1.0MHz	-	503	-	pF
Output Capacitance	C_{oss}		-	67	-	pF
Reverse Transfer Capacitance	C_{rss}		-	58	-	pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} =-10V, I_D =-2.3A, R_G = 1Ω, V_{GS}=-4.5V	-	11	-	ns
Rise Time	t_r		-	52	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	16	-	ns
Fall Time	t_f		-	10	-	ns
Total Gate Charge	Q_g	V_{DS} = -10V, V_{GS} = -4.5V, I_D = -2A	-	4.1	-	nC
	Q_{gs}		-	0.8	-	nC
	Q_{gd}		-	1.1	-	nC
Diode Forward Voltage	V_{FSD}	I_{SD} =-3A, V_{GS} = 0	-0.5	-	-1.2	V

Note 2：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.

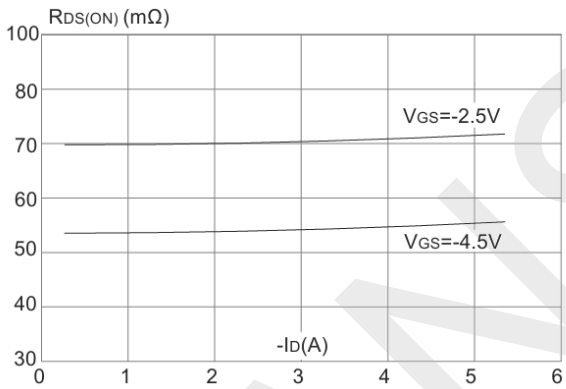
6.Typical Electrical and Thermal Characteristics



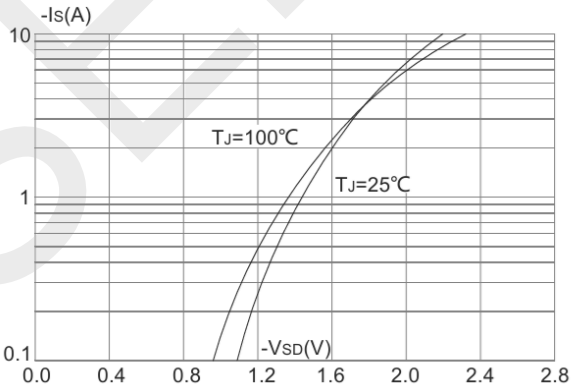
Output Characteristics



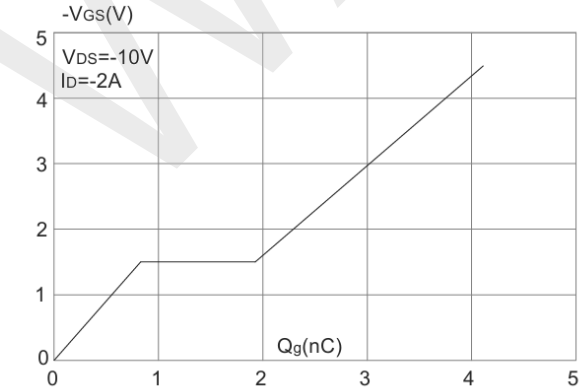
Typical Transfer Characteristics



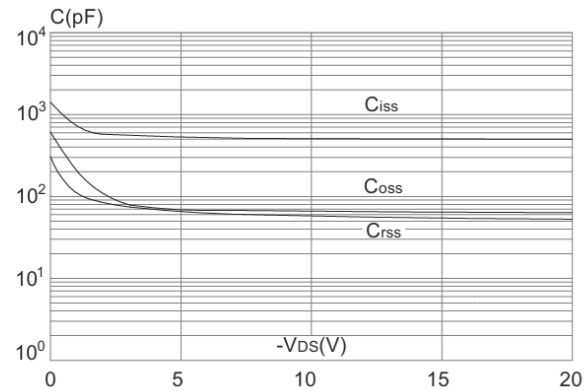
On-resistance vs. Drain Current



Body Diode Characteristics

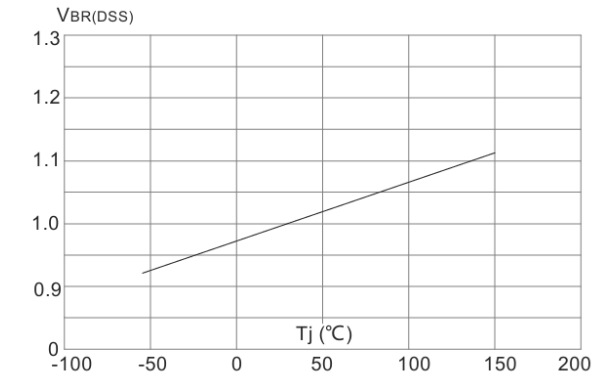


Gate Charge Characteristics



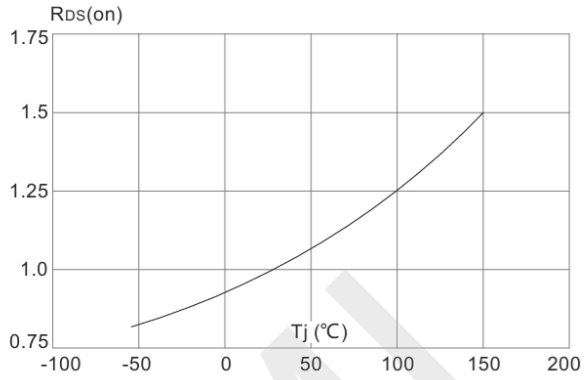
Capacitance Characteristics

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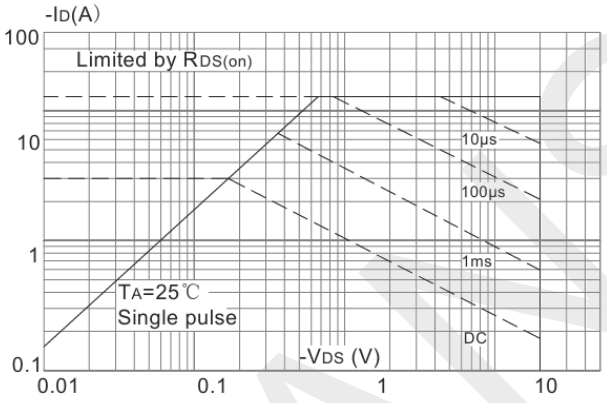
Normalized Breakdown Voltage vs.

Junction Temperature

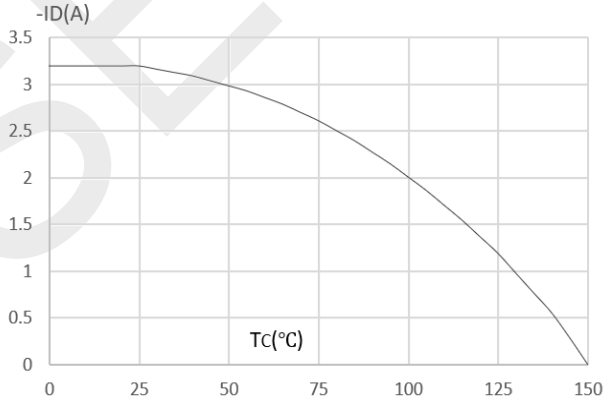


Normalized on Resistance vs.

Junction Temperature

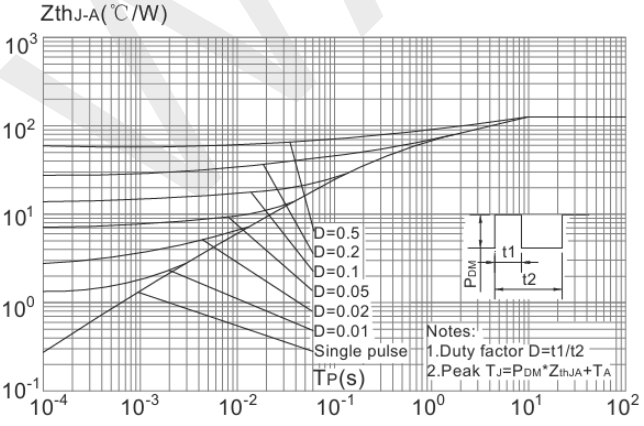


Maximum Safe Operating Area



Maximum Continuous Drain Current vs.

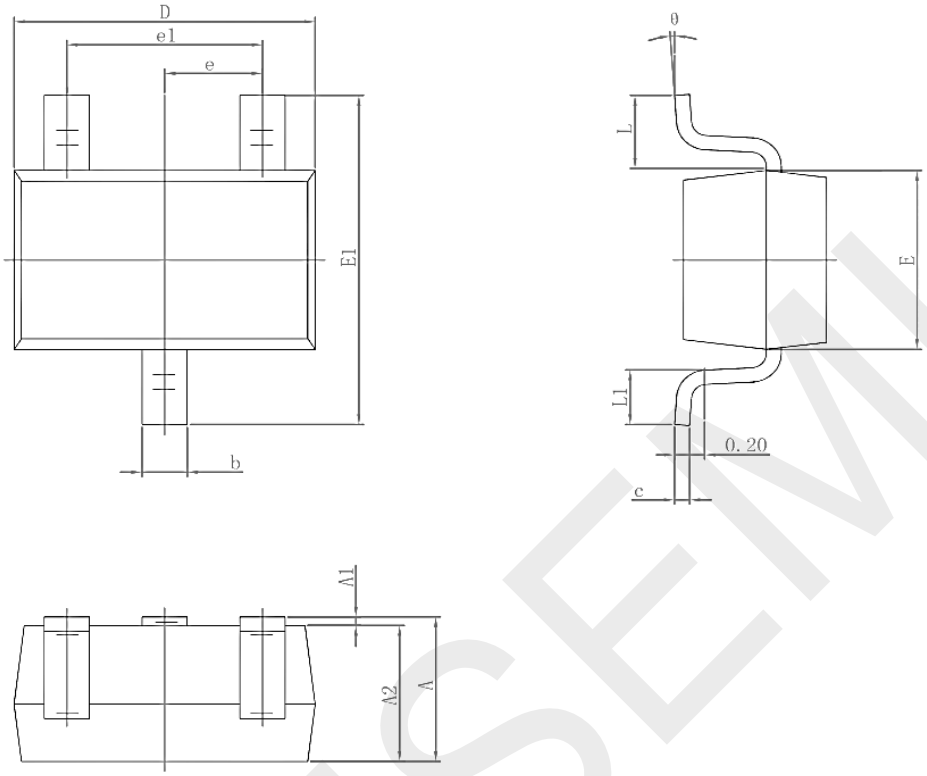
Case Temperature



Normalized Maximum Transient

Thermal Impedance

7.Package Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 REF.		0.021 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

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