AT2305

20V P-Channel MOSFET

Features

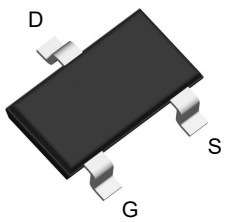
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

Product Summary

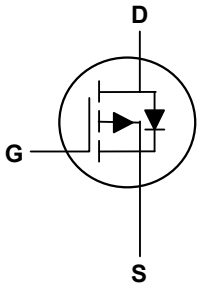
V_{DS}	-20	V
I_D	-3.9	A
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	65	mΩ
$R_{DS(ON)}$ (at V_{GS}=-2.5V)	80	mΩ

Applications

- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



SOT23 Top View



Absolute Maximum Ratings(T_A=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	-3.9	A
Pulsed Drain Current[2]	I_{DM}	-15	A
Total Power Dissipation[3]	P_D@T_A=25℃	1.2	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	---	89	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-20	---	---	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-4.5V , I_D=-3.9A	---	55	65	mΩ
		V_{GS}=-2.5V , I_D=-2A	---	70	80	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-0.5	---	-1.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-16V, V_{GS}=0V, T_J=25℃	---	---	1	uA
		V_{DS}=-16V, V_{GS}=0V, T_J=55℃	---	---	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±8V , V_{DS}=0V	---	---	±100	nA
Total Gate Charge	Q_g	V_{DS}=-10V , V_{GS}=-4.5V , I_D=-2.8A	---	7.7	---	nC
Gate-Source Charge	Q_{gs}		---	1	---	
Gate-Drain Charge	Q_{gd}		---	2	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-10V , V_{GS}=-4.5V , R_G=6Ω, I_D=-2.8A	---	8	---	ns
Rise Time	T_r		---	36	---	
Turn-Off Delay Time	$T_{d(off)}$		---	60	---	
Fall Time	T_f		---	42	---	
Input Capacitance	C_{iss}	V_{DS}=-10V , V_{GS}=0V , f=1MHz	---	600	---	pF
Output Capacitance	C_{oss}		---	120	---	
Reverse Transfer Capacitance	C_{rss}		---	95	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S		---	---	-3.9	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-0.75A , T_J=25℃	---	---	-1.5	V

Note:

1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The power dissipation is limited by 150℃ junction temperature

Typical Characteristics

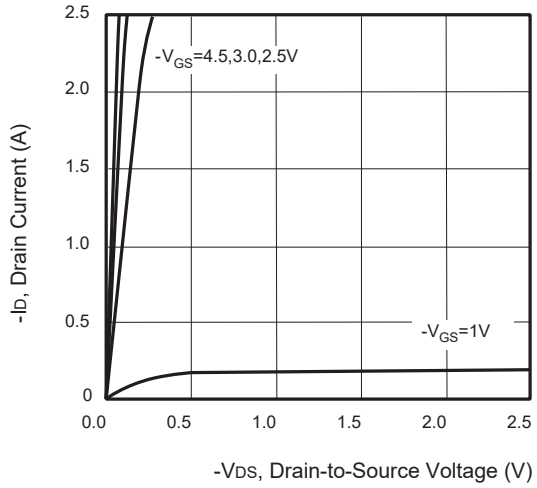


Figure 1. Output Characteristics

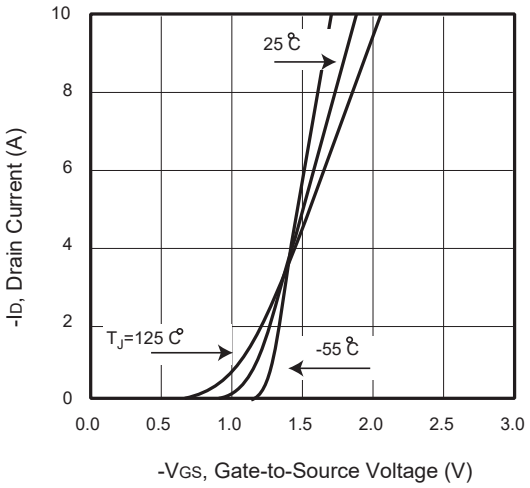


Figure 2. Transfer Characteristics

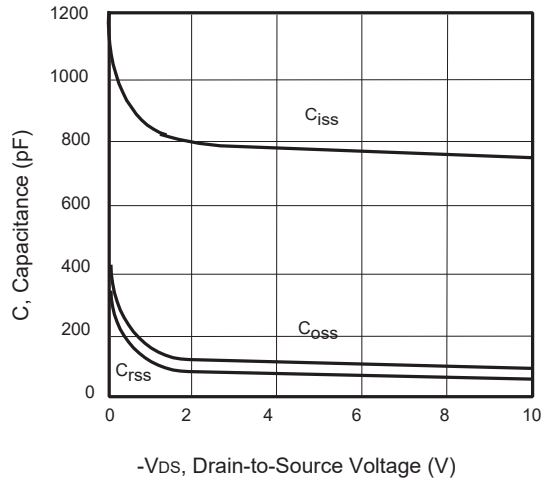


Figure 3. Capacitance

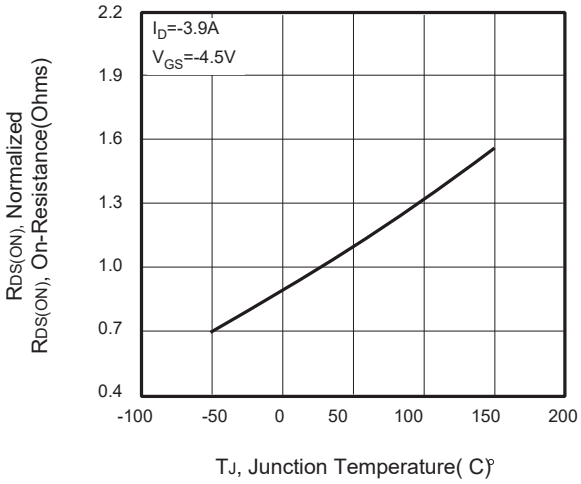


Figure 4. On-Resistance Variation with Temperature

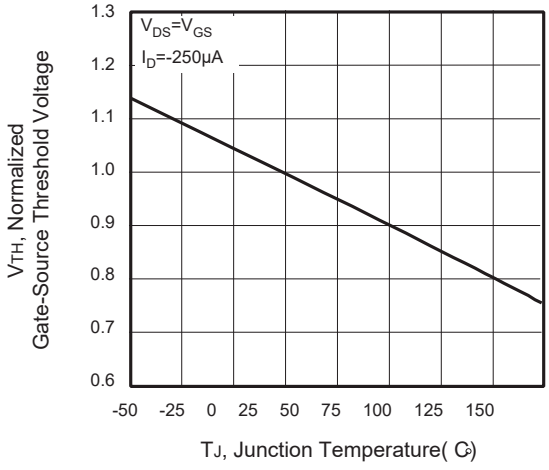


Figure 5. Gate Threshold Variation with Temperature

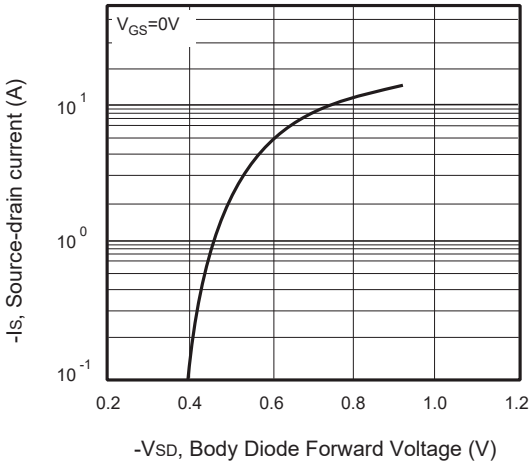


Figure 6. Body Diode Forward Voltage Variation with Source Current

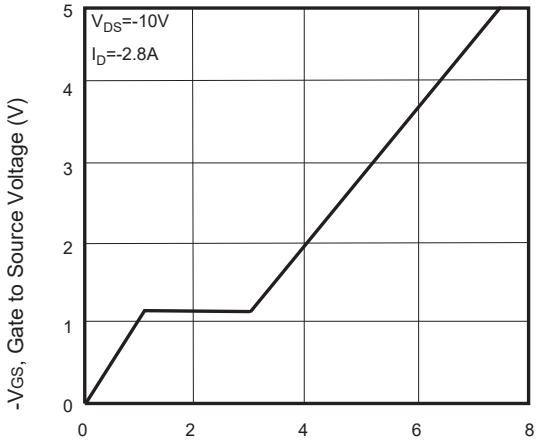


Figure 7. Gate Charge

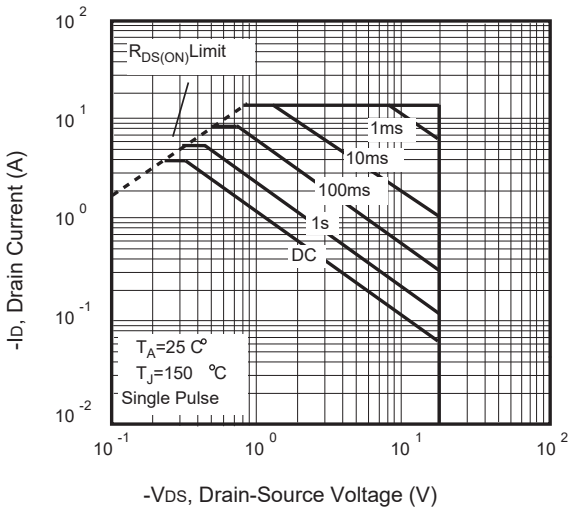


Figure 8. Maximum Safe Operating Area

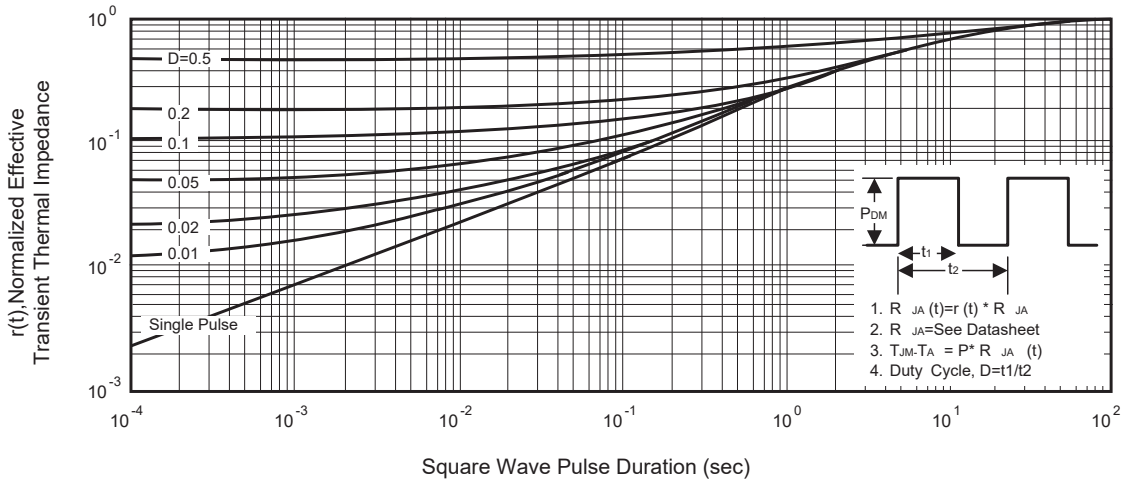
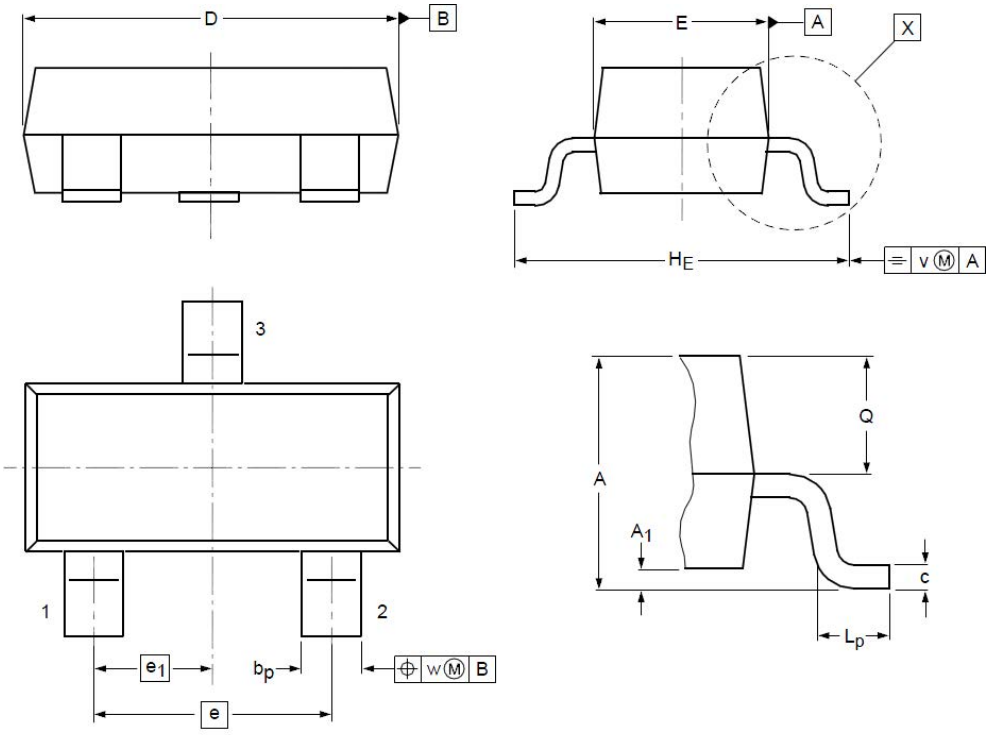


Figure 9. Normalized Thermal Transient Impedance Curve

SOT23 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.05	1.20	**e_1**	--	0.95	--
A_1	0.01	0.05	0.10	**H_E**	2.10	2.40	2.50
b_p	0.38	0.42	0.48	**L_P**	0.40	0.50	0.60
c	0.09	0.13	0.15	**Q**	0.45	0.49	0.55
D	2.80	2.92	3.00	**V**	--	0.20	--
E	1.20	1.33	1.40	**W**	--	0.10	--
e	--	1.90	--				