AT2300

20V N-Channel MOSFET

Features

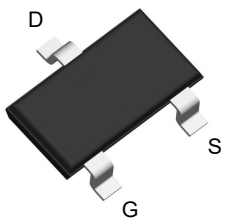
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

Product Summary

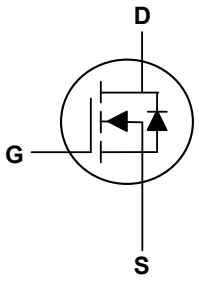
V_{DS}	20	V
I_D	5	A
$R_{DS(ON)}$ (at V_{GS}=4.5V)	30	mΩ
$R_{DS(ON)}$ (at V_{GS}=2.5V)	40	mΩ

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}	±12	V
Continuous Drain Current[1]	I_D	5	A
Pulsed Drain Current[2]	I_{DM}	20	A
Total Power Dissipation[3]	P_D	1.25	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]	$R_{\theta JA}$	---	100	℃/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	$R_{DS(ON)}$	V_{GS}=4.5V , I_D=5A	---	26	30	mΩ
		V_{GS}=2.5V , I_D=4A	---	32	40	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	0.45	0.65	1.0	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=20V, V_{GS}=0V	---	---	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=5V , I_D=5A	---	5	---	S
Total Gate Charge	Q_g	V_{DS}=10V , V_{GS}=4.5V , I_D=5A	---	2.7	---	nC
Gate-Source Charge	Q_{gs}		---	0.4	---	
Gate-Drain Charge	Q_{gd}		---	0.5	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=10V , V_{GS}=4.5V , R_G=6Ω, R_L=3.3Ω	---	2.3	---	ns
Rise Time	T_r		---	3.1	---	
Turn-Off Delay Time	$T_{d(off)}$		---	21	---	
Fall Time	T_f		---	2.6	---	
Input Capacitance	C_{iss}	V_{DS}=10V , V_{GS}=0V , f=1MHz	---	240	---	pF
Output Capacitance	C_{oss}		---	45	---	
Reverse Transfer Capacitance	C_{rss}		---	23	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S	T_A=25℃	---	---	1.6	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V, I_S=5A , T_A=25℃	---	0.76	1.16	V

Note:

1.The data tested by surface mounted on a 1 inch² 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

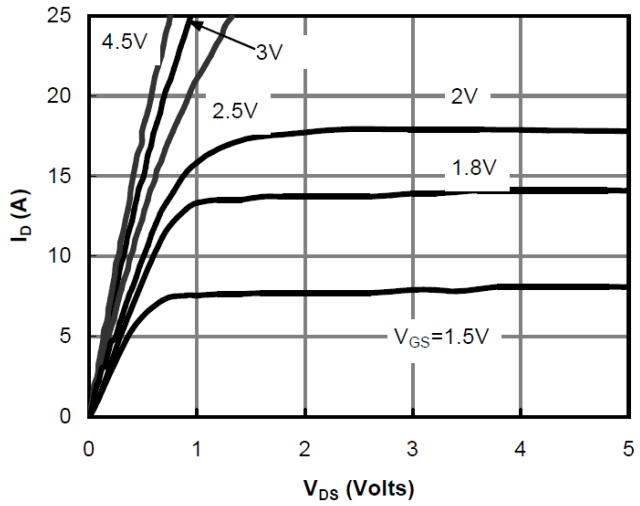


Figure 1: On-Region Characteristics

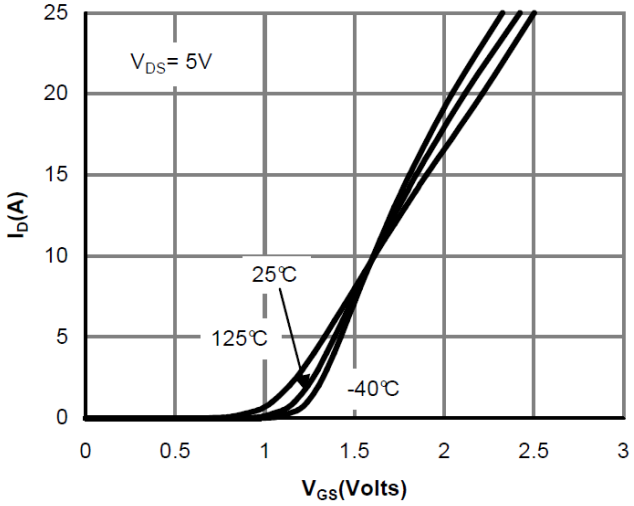


Figure 2: Transfer Characteristics

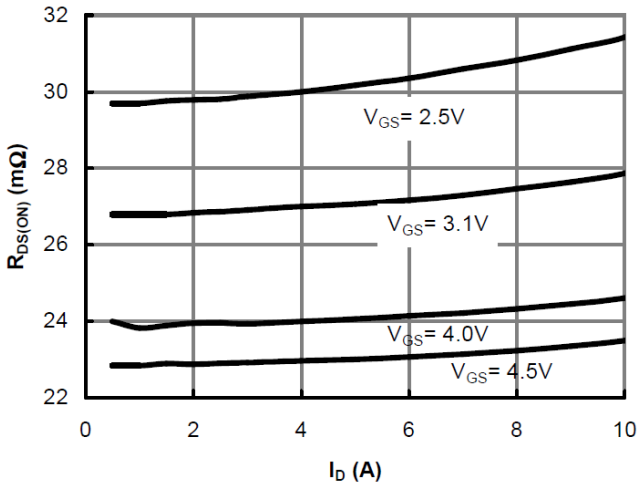


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

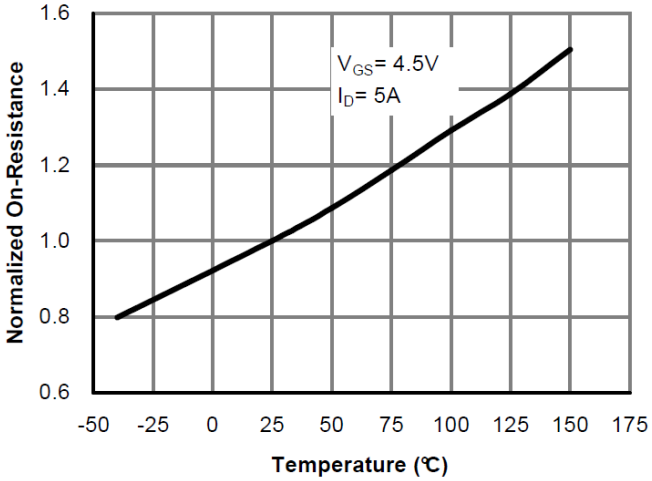


Figure 4: On-Resistance vs. Junction Temperature

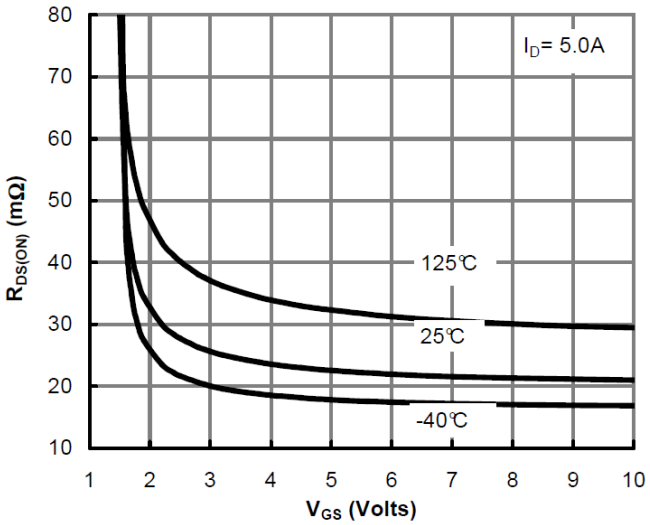


Figure 5: On-Resistance vs. Gate-Source Voltage

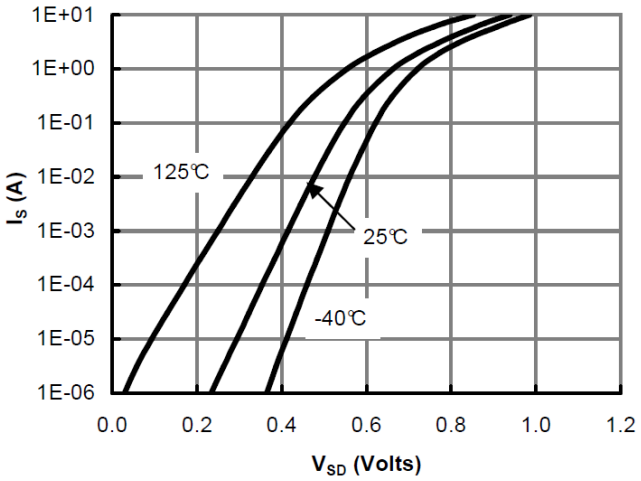


Figure 6: Body-Diode Characteristics

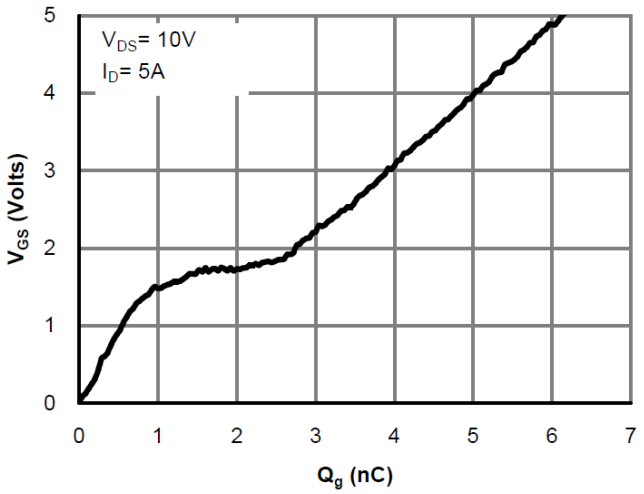


Figure 7: Gate-Charge Characteristics

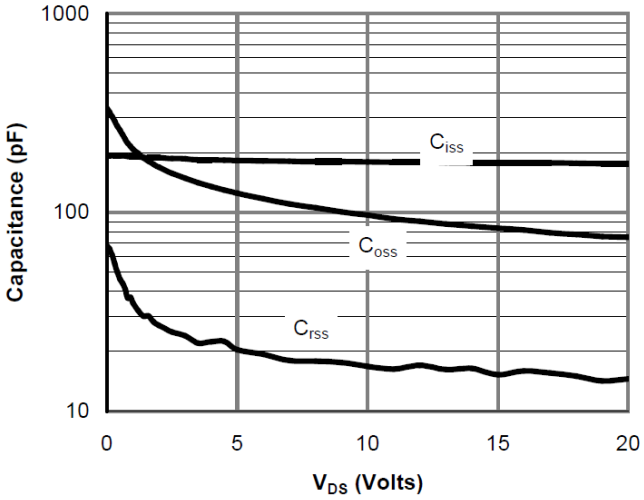


Figure 8: Capacitance Characteristics

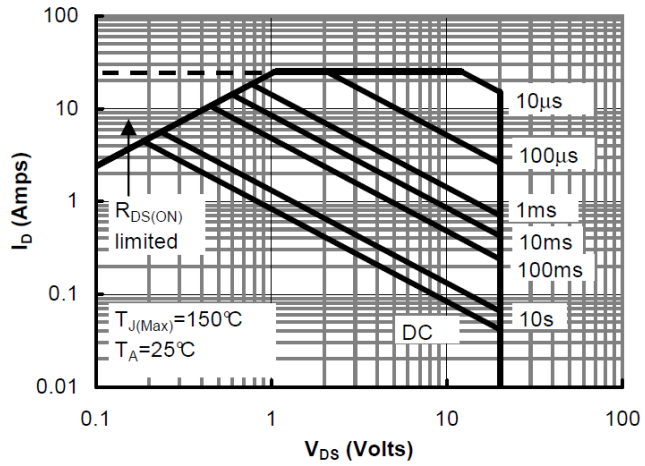


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

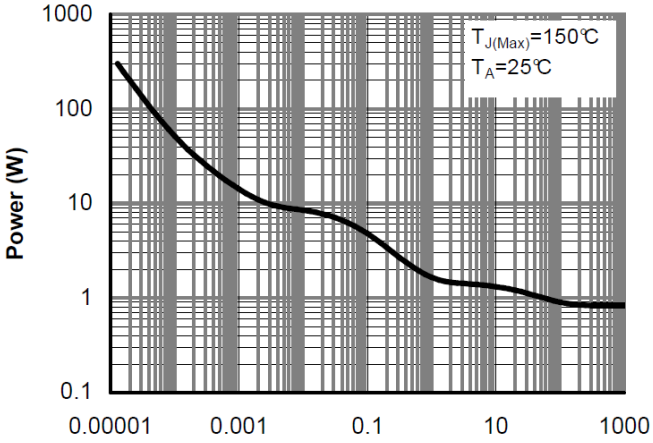


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

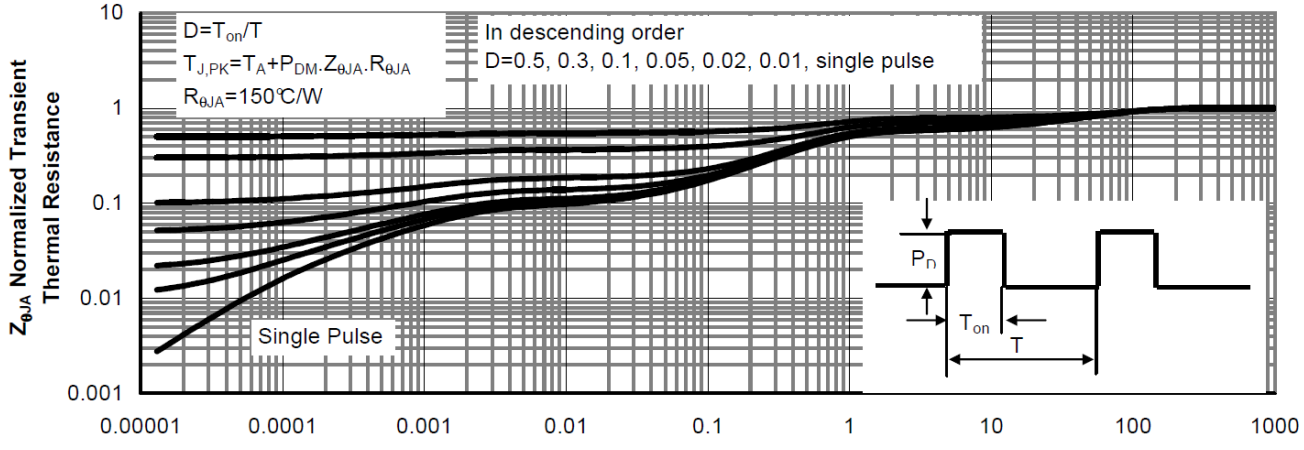
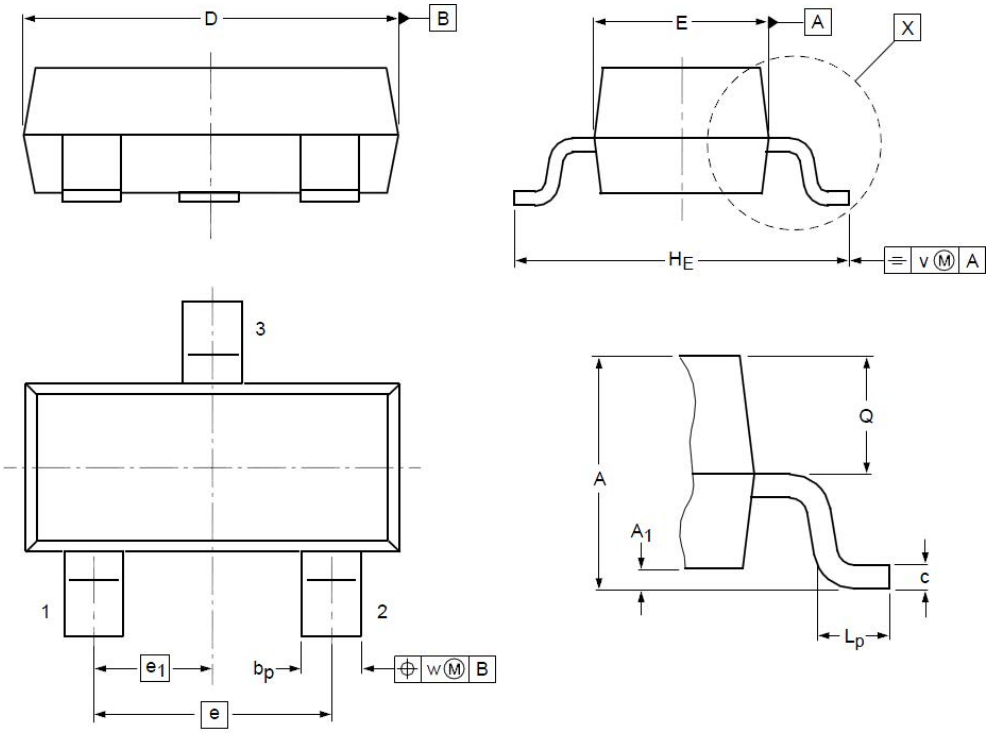


Figure 11: Normalized Maximum Transient Thermal Impedance(Note E)

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	--				