AT30P08A

30V Dual P-Channel MOSFET

Features

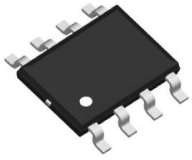
- Advanced high cell density Trench technology
- Low $R_{DS(ON)}$
- High Current Capability
- Green Device Available

Product Summary

V_{DS}	-30	V
I_D	-7.6	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	55	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	65	mΩ

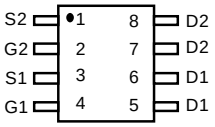
Applications

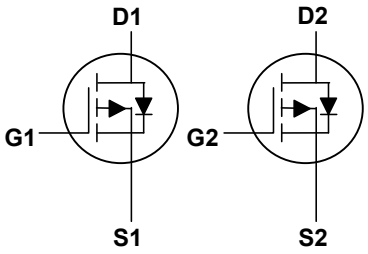
- High Frequency Point-of-Load,Synchronous Buck Converter for MB/NB/UMPC/VGA
- Battery Protection Charge/Discharge
- Load Switch



SOP-8 Top View

Top View





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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@T_A=25℃	-7.6	A
Continuous Drain Current	I_D@T_A=70℃	-6.1	A
Pulsed Drain Current[2]	I_{DM}	-38	A
Total Power Dissipation[3]	P_D@T_A=25℃	2	W
Total Power Dissipation[3]	P_D@T_A=70℃	1.28	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](t≦10s)	$R_{\theta JA}$	48	62.5	℃/W
Thermal Resistance Junction-Ambient[1](Steady State)		74	90	℃/W
Thermal Resistance Junction-Lead(Steady State)	$R_{\theta JL}$	32	40	℃/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	-30	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-7.6A	---	45.5	55	mΩ
		V_{GS}=-4.5V , I_D=-7A	---	57.5	65	mΩ
		V_{GS}=-2.5V , I_D=-6A	---	75	85	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-0.6	-0.9	-1.5	V
On state drain current	$I_{D(ON)}$	V_{GS}=-10V,V_{DS}=-5V	-38	---	---	A
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-20V , V_{GS}=0V , T_J=55℃	---	---	-5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=-5V , I_D=-7.6A	---	25	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	0.8	1.7	2.6	Ω
Total Gate Charge (10V)	Q_g	V_{DS}=-15V , V_{GS}=-10V , I_D=-7.6A	---	12.5	---	nC
Total Gate Charge (4.5V)	Q_g		---	6	---	
Gate-Source Charge	Q_{gs}		---	1	---	
Gate-Drain Charge	Q_{gd}		---	2	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=-15V , V_{GS}=-10V , R_L=1.3Ω, R_G=3Ω	---	3	---	ns
Rise Time	T_r		---	7.5	---	
Turn-Off Delay Time	$T_{d(off)}$		---	20	---	
Fall Time	T_f		---	6	---	
Input Capacitance	C_{iss}	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	525	630	pF
Output Capacitance	C_{oss}		---	95	125	
Reverse Transfer Capacitance	C_{rss}		---	75	105	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1,4]	I_S	V_G=V_D=0V , Force Current	---	---	-2.5	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25℃	---	-0.7	-1	V
Reverse Recovery Time	t_{rr}	I_F=-7.6A ,di/dt=100A/μs, T_J=25℃	---	14	---	nS
Reverse Recovery Charge	Q_{rr}		---	6	---	nC

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

4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

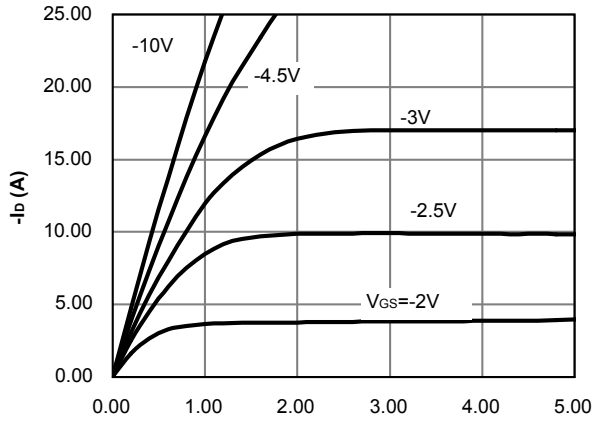


Fig 1: On-Region Characteristics

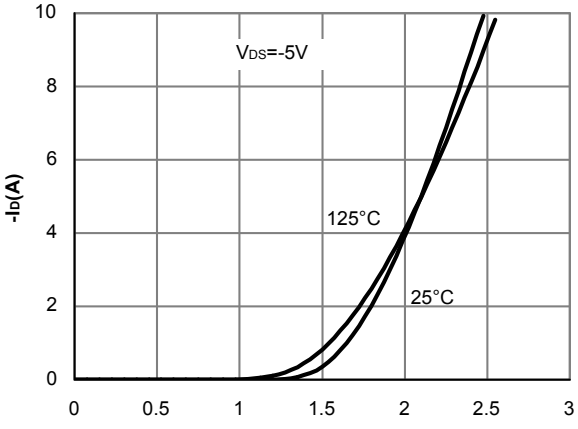


Figure 2: Transfer Characteristics

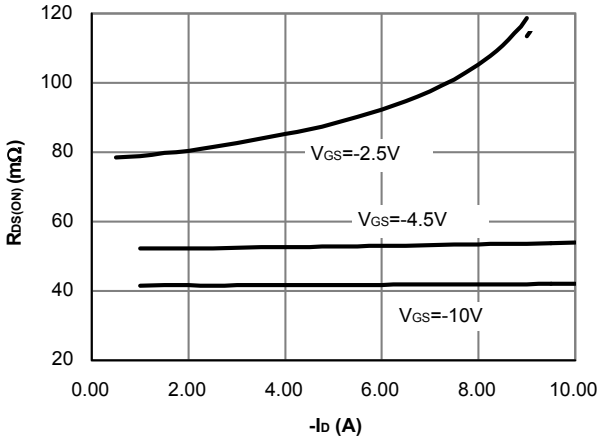


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

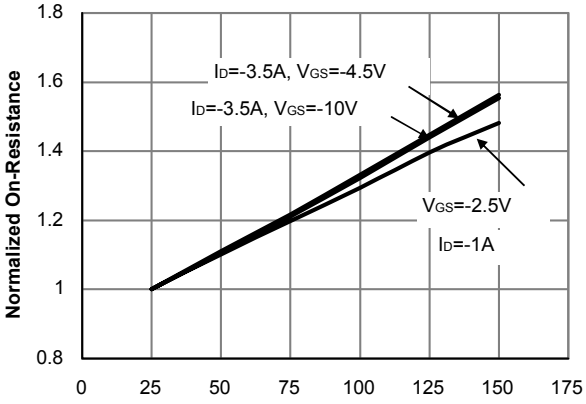


Figure 4: On-Resistance vs. Junction Temperature

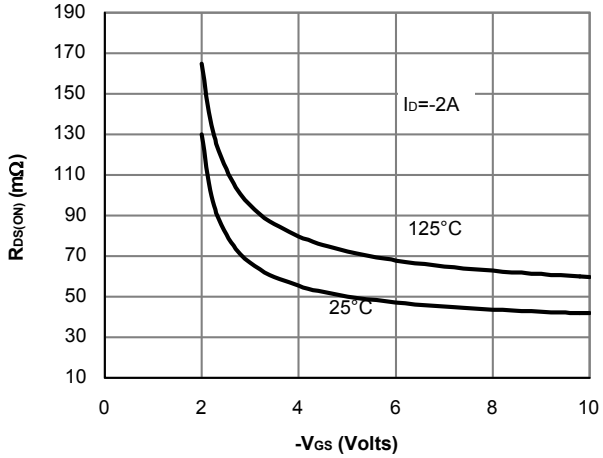


Figure 5: On-Resistance vs. Gate-Source Voltage

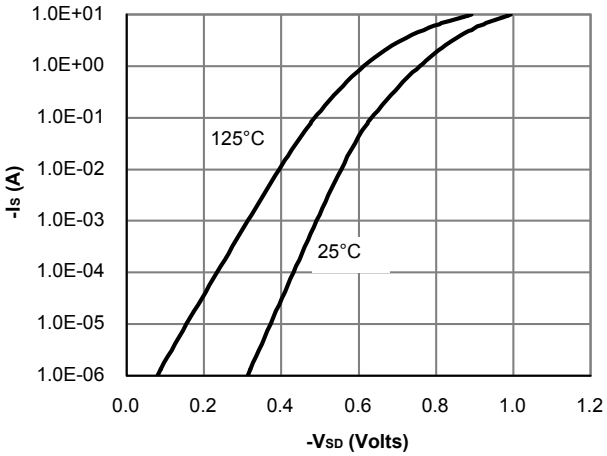


Figure 6: Body-Diode Characteristics

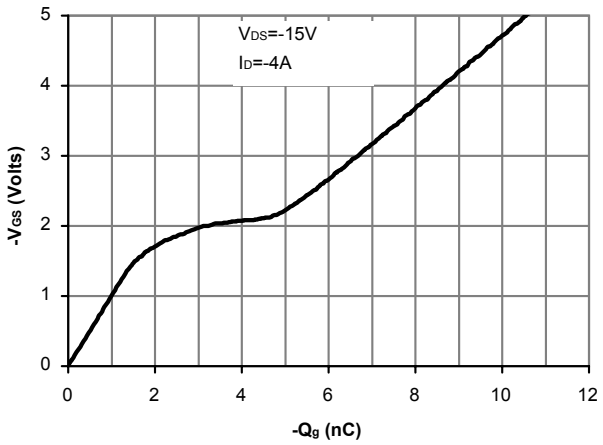


Figure 7: Gate-Charge Characteristics

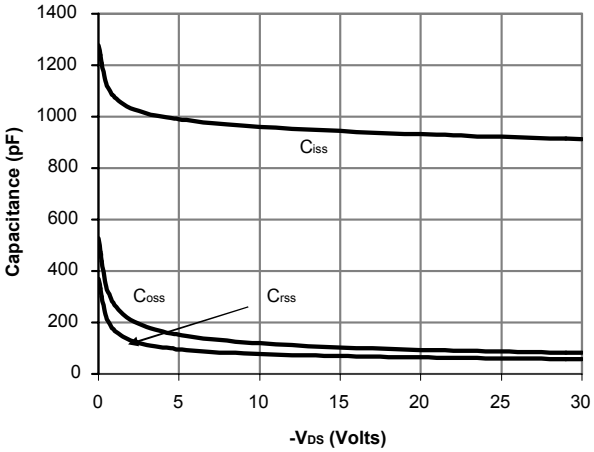


Figure 8: Capacitance Characteristics

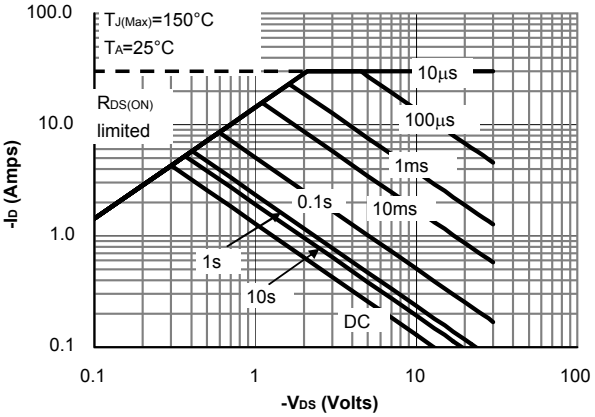


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

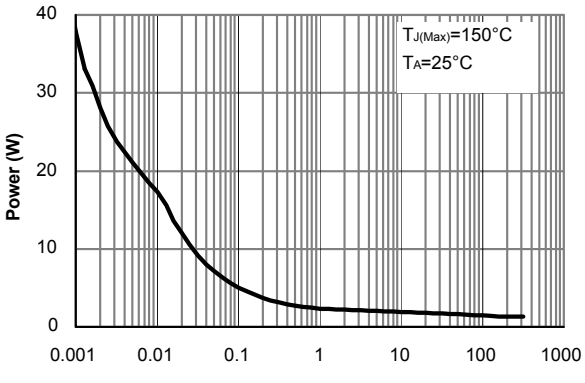


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

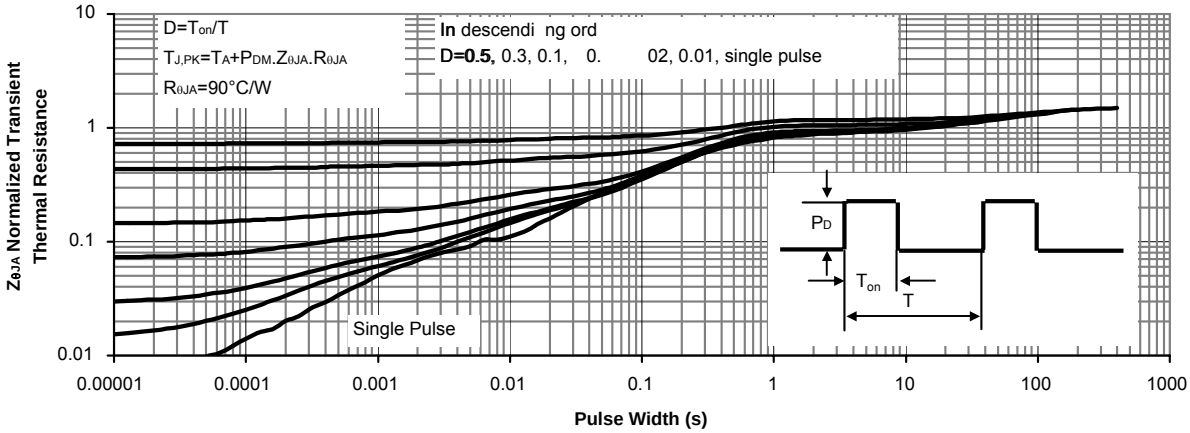
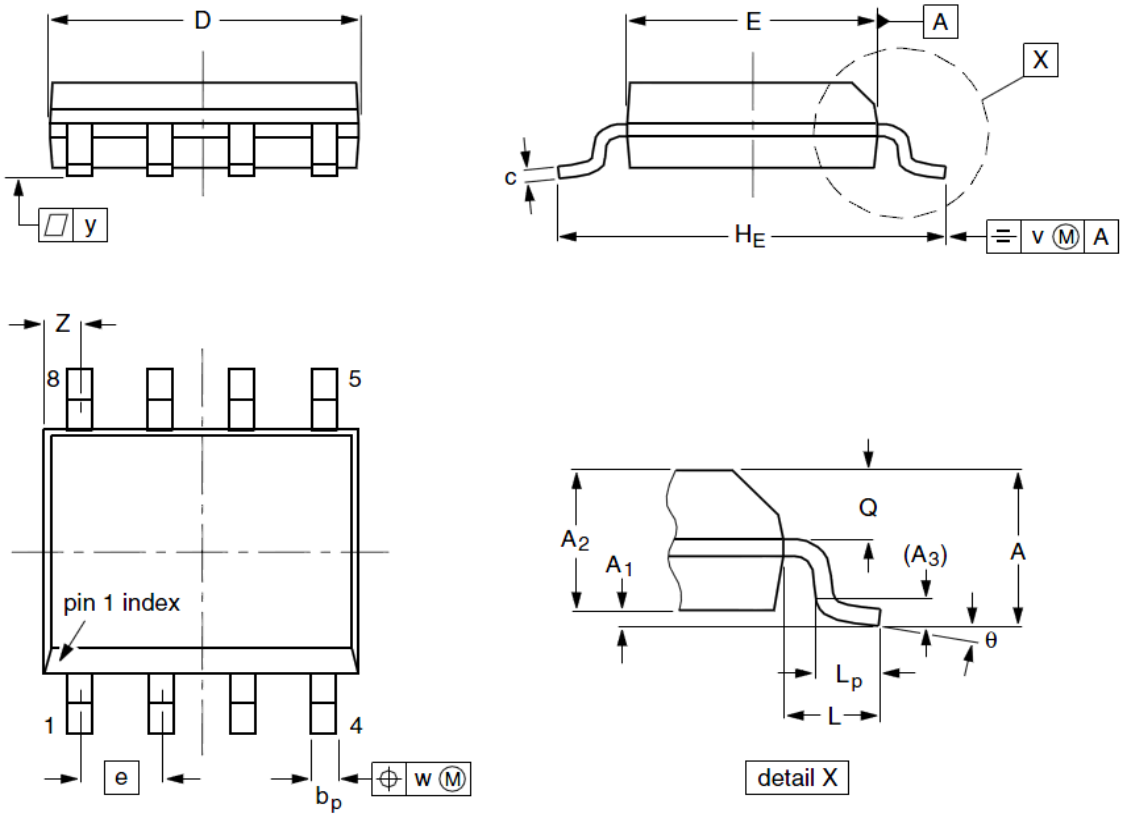


Figure 11: Normalized Maximum Transient Thermal Impedance

SOP-8 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	1.35	1.55	1.75	**A_1**	0.10	0.18	0.25
A_2	1.25	1.45	1.65	**A_3**	--	0.25	--
b_p	0.36	0.42	0.51	**c**	0.19	0.22	0.25
D	4.70	4.92	5.10	**E**	3.80	3.90	4.00
e	--	1.27	--	**H_E**	5.80	6.00	6.20
L	--	1.05	--	**L_P**	0.40	0.68	1.00
Q	0.60	0.65	0.73	**v**	--	0.25	--
w	--	0.25	--	**y**	--	0.10	--
Z	0.30	0.50	0.70	**θ**	0°		8°