AT06045S

60V N-Channel MOSFET

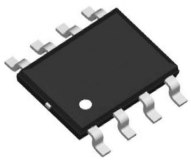
Description

The AT06045S is the high cell density trenched N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The AT06045S meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

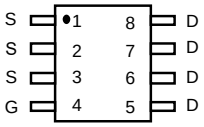
Product Summary

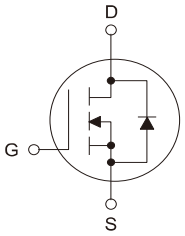
V_{DS}	60 V
I_D (at V_{GS}=10V)	4.5 A
$R_{DS(ON)}$ (at V_{GS}=10V)	40 mΩ
$R_{DS(ON)}$ (at V_{GS}=4.5V)	50 mΩ



SOP-8 Top View

Top View





Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, VGS @ 10V	I_D@T_A=25℃	4.5	A
Continuous Drain Current, VGS @ 10V	I_D@T_A=70℃	3.5	A
Pulsed Drain Current[2]	I_{DM}	18	A
Single Pulse Avalanche Energy[3]	EAS	22	mJ
Avalanche Current	I_{AS}	21	A
Total Power Dissipation	P_D@T_A=25℃	1.5	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Data

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	---	85	℃/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	---	25	℃/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	60	---	---	V
BV_{DSS} Temperature Coefficient	BV_{DSS}/T_J	Reference to 25℃ , I_D=1mA	---	0.044	---	V/℃
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=10V , I_D=4A	---	---	40	mΩ
		V_{GS}=4.5V , I_D=2A	---	---	50	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.0	---	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$V_{GS(th)}$		---	-4.8	---	mV/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=48V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=48V , V_{GS}=0V , T_J=55℃	---	---	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=5V , I_D=4A	---	28.3	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.5	---	Ω
Total Gate Charge (10V)	Q_g	V_{DS}=48V , V_{GS}=10V , I_D=4A	---	19	---	nC
Gate-Source Charge	Q_{gs}		---	2.6	---	
Gate-Drain Charge	Q_{gd}		---	4.1	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=30V , V_{GS}=10V , R_G=3.3Ω, I_D=4A	---	3	---	ns
Rise Time	T_r		---	34	---	
Turn-Off Delay Time	$T_{d(off)}$		---	23	---	
Fall Time	T_f		---	6	---	
Input Capacitance	C_{iss}	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	1027	---	pF
Output Capacitance	C_{oss}		---	65	---	
Reverse Transfer Capacitance	C_{rss}		---	46	---	

Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1,5]	I_S	V_G=V_D=0V , Force Current	---	---	4.5	A
Pulsed Source Current	I_{SM}		---	---	18	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.2	V
Reverse Recovery Time	t_{rr}	I_F=4A ,di/dt=100A/μs， T_J=25℃	---	12.1	---	nS
Reverse Recovery Charge	Q_{rr}		---	6.7	---	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 EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=21A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics