AT06050M

60V N-Channel MOSFET

Features

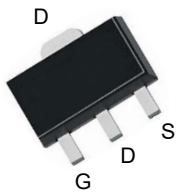
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

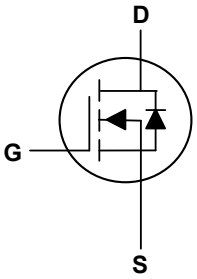
V_{DS}	60	V
I_D	5	A
$R_{DS(ON)}$ (at V_{GS}=10V)	90	mΩ
$R_{DS(ON)}$ (at V_{GS}=4.5V)	100	mΩ

Applications

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



SOT89 Top View



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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D@T_C=25℃	5	A
Continuous Drain Current[1]	I_D@T_C=100℃	2.2	A
Pulsed Drain Current[2]	I_{DM}	16	A
Single Pulse Avalanche Energy[3]	E_{AS}	6.5	mJ
Total Power Dissipation[4]	P_D	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]	$R_{\theta JA}$	---	85	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	24	℃/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
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=2A	---	70	90	mΩ
		V_{GS}=4.5V , I_D=1A	---	80	100	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.0	---	2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=48V , V_{GS}=0V , T_J=25℃	---	---	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Total Gate Charge	Q_g	V_{DS}=48V , V_{GS}=4.5V , I_D=2A	---	5.2	---	nC
Gate-Source Charge	Q_{gs}		---	1.5	---	
Gate-Drain Charge	Q_{gd}		---	2	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=30V , V_{GS}=10V , R_G=3.3Ω, I_D=2A	---	3	---	ns
Rise Time	T_r		---	6	---	
Turn-Off Delay Time	$T_{d(off)}$		---	22	---	
Fall Time	T_f		---	13	---	
Input Capacitance	C_{iss}	V_{DS}=15V , V_{GS}=0V , f=1MHz	---	510	---	pF
Output Capacitance	C_{oss}		---	36	---	
Reverse Transfer Capacitance	C_{rss}		---	25	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=2A , T_J=25℃	---	0.8	1.2	V
Reverse Recovery Time	t_{rr}	I_F=2A ,V_R=0V di/dt=100A/μs， T_J=25℃	---	9	---	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 EAS data shows Max. rating . The test condition is V_{DD}=30V,L=0.1mH

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

Typical Characteristics

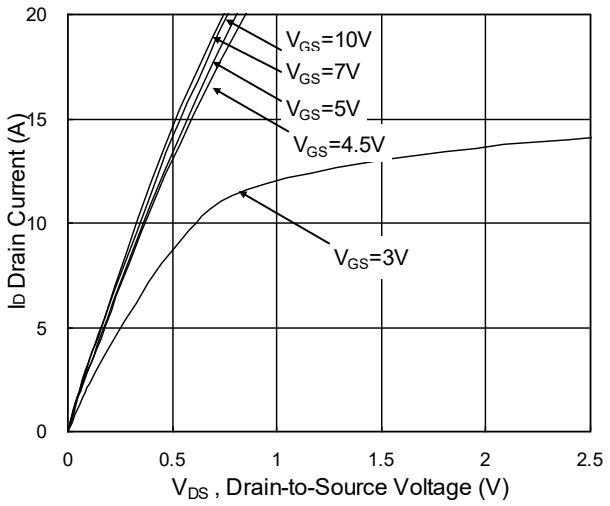


Fig.1 Typical Output Characteristics

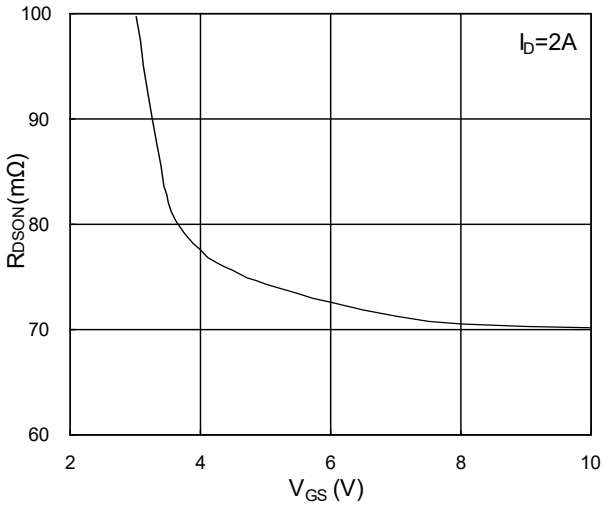


Fig.2 On-Resistance vs. Gate-Source

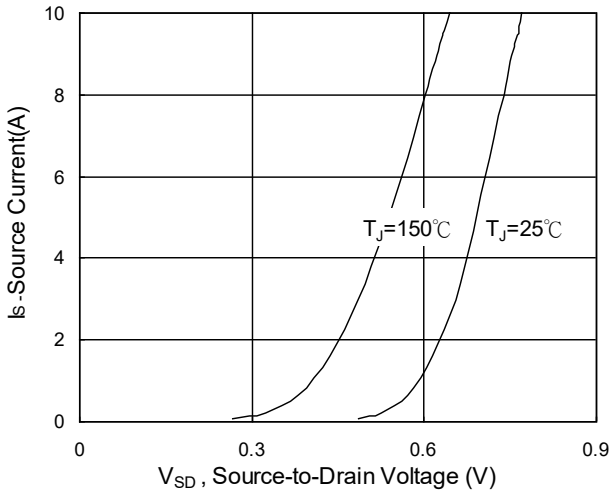


Fig.3 Forward Characteristics Of Reverse

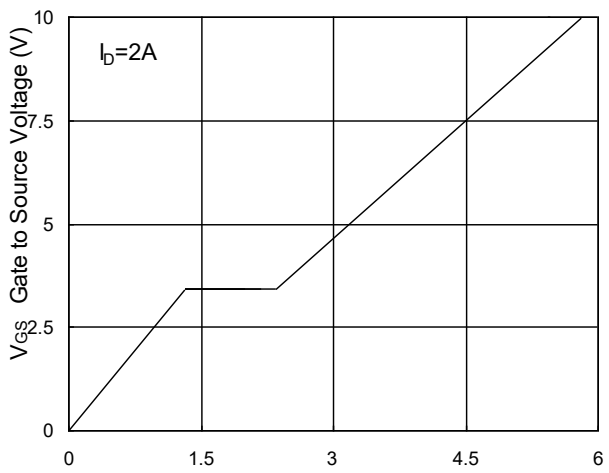


Fig.4 Gate-Charge Characteristics

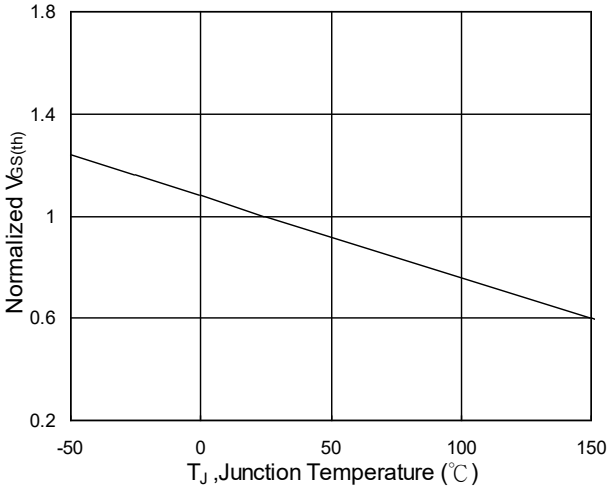


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

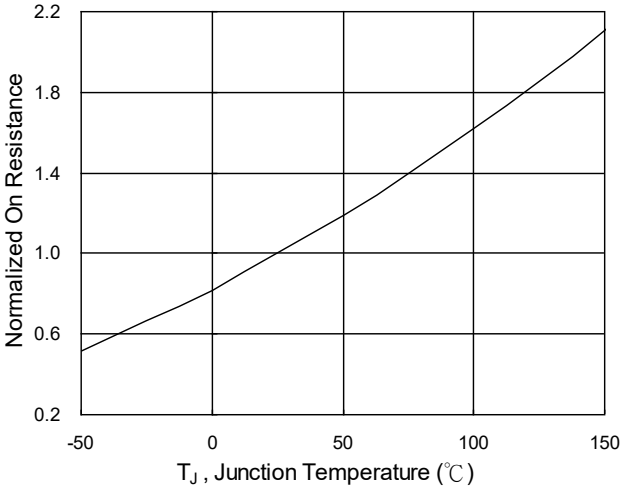


Fig.6 Normalized R_{DSON} vs. T_J

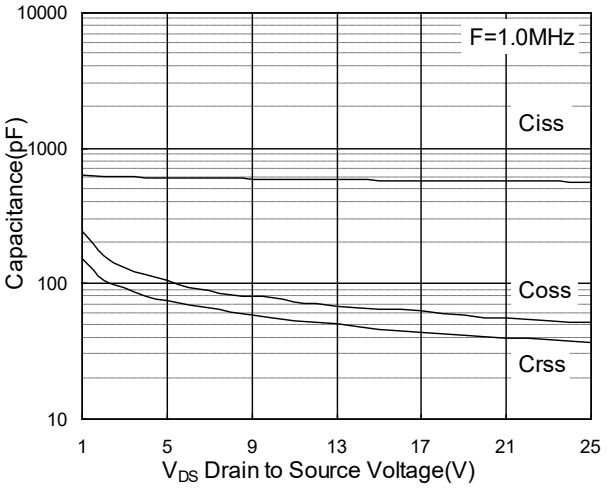


Fig.7 Capacitance

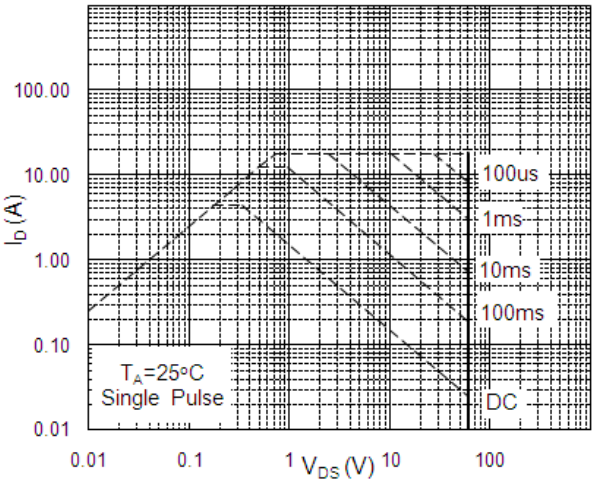


Fig.8 Safe Operating Area

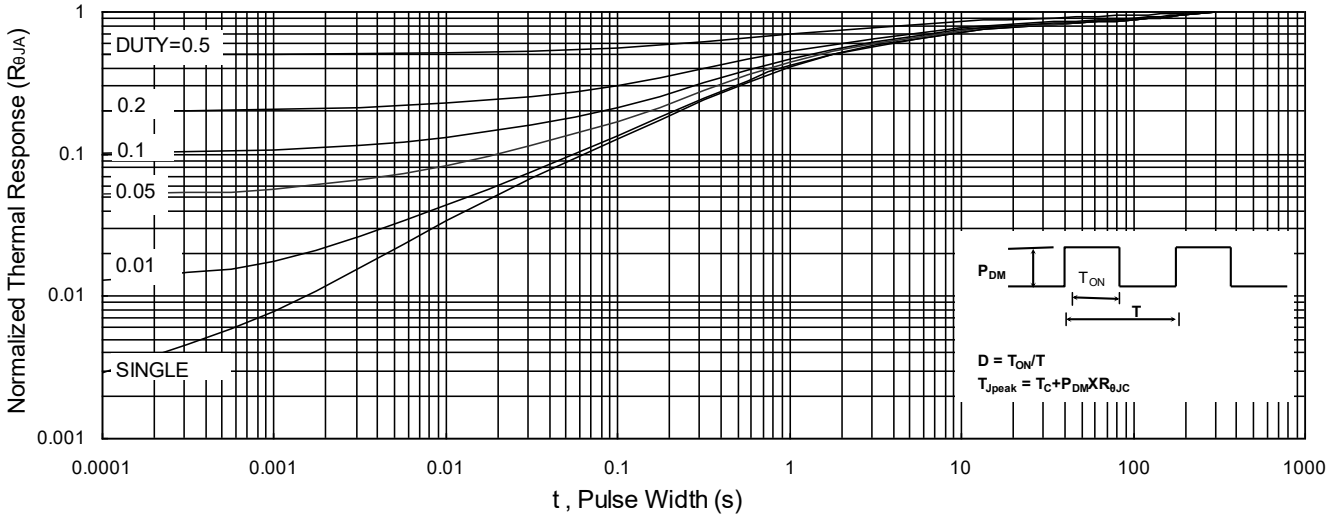


Fig.9 Normalized Maximum Transient Thermal Impedance

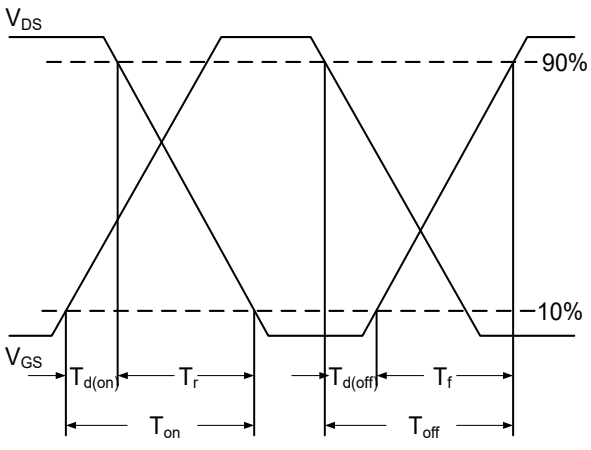


Fig.10 Switching Time Waveform

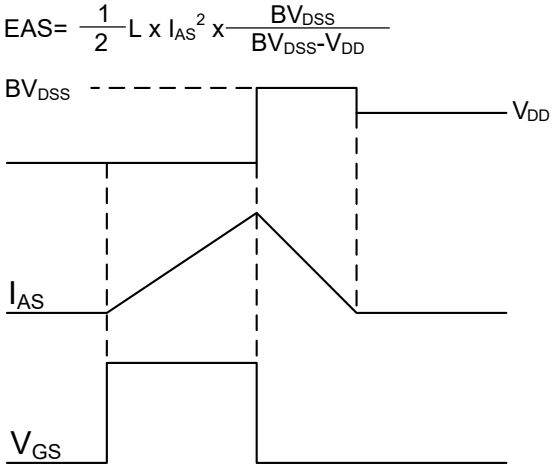
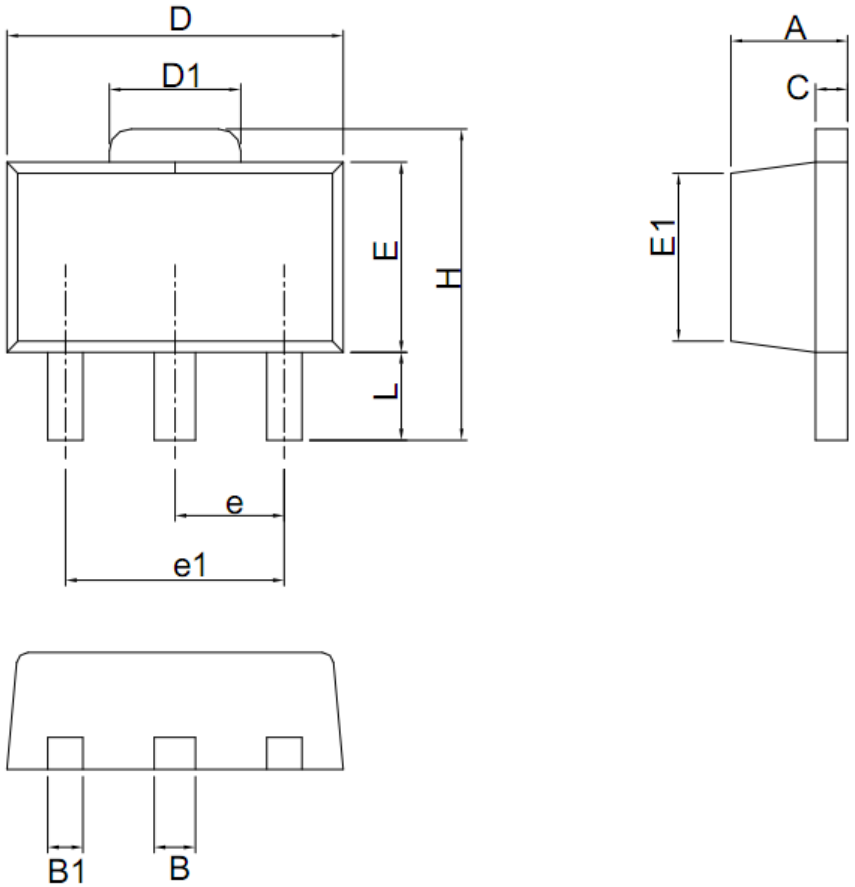


Fig.11 Unclamped Inductive Switching Waveform

SOT89 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	1.40	1.50	1.60	E	2.40	2.50	2.60
B	0.40	0.50	0.56	E1	2.10	2.20	2.30
B1	0.32	0.40	0.50	e	1.50 BSC		
C	0.35	0.40	0.44	e1	3.00 BSC		
D	4.40	4.50	4.60	H	3.94	4.10	4.25
D1	1.40	1.60	1.80	L	0.85	1.00	1.20