AT06500BK

60V N-Channel MOSFET

Features

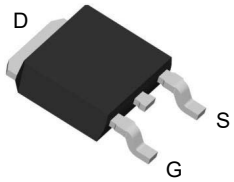
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

Product Summary

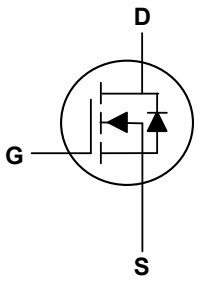
V_{DS}	60	V
I_D	50	A
$R_{DS(ON)}$ (at V_{GS}=10V)	18	mΩ
$R_{DS(ON)}$ (at V_{GS}=4.5V)	24	mΩ

Applications

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



TO-252 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℃	50	A
Continuous Drain Current[1]	I_D@T_C=100℃	35	A
Pulsed Drain Current[2]	I_{DM}	90	A
Total Power Dissipation[3]	P_D	20	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-Case[1]	$R_{\theta JC}$	---	1.7	℃/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=50A	---	14	18	mΩ
		V_{GS}=4.5V , I_D=36A	---	18	24	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.0	---	3.0	V
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=85℃	---	---	5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Total Gate Charge	Q_g	V_{DS}=30V , V_{GS}=10V , I_D=12A	---	9	---	nC
Gate-Source Charge	Q_{gs}		---	1.6	---	
Gate-Drain Charge	Q_{gd}		---	1.8	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=30V , V_{GS}=10V , R_G=3Ω, I_D=5A	---	6	---	ns
Rise Time	T_r		---	4.6	---	
Turn-Off Delay Time	$T_{d(off)}$		---	22	---	
Fall Time	T_f		---	4	---	
Input Capacitance	C_{iss}	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	540	---	pF
Output Capacitance	C_{oss}		---	74	---	
Reverse Transfer Capacitance	C_{rss}		---	34	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	0.7	1.3	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

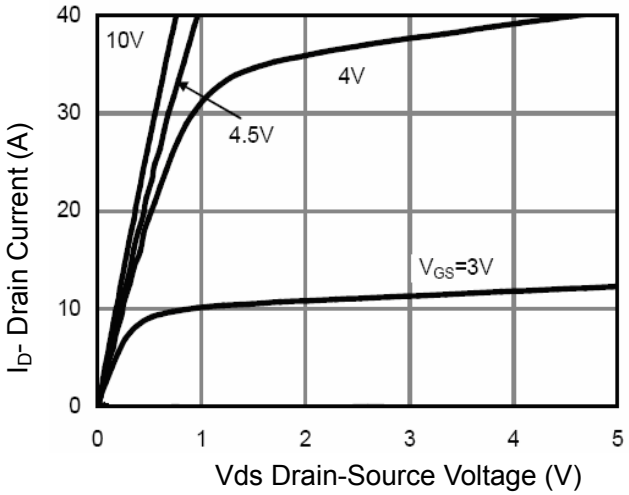


Figure 1 Output Characteristics

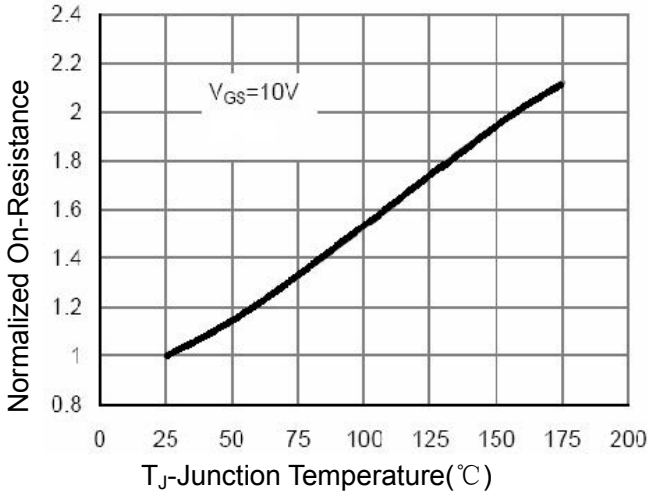


Figure 2 Rdson-Junction Temperature

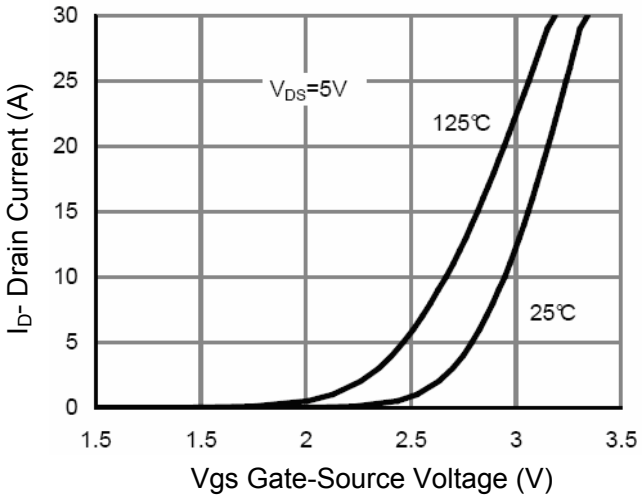


Figure 3 Transfer Characteristics

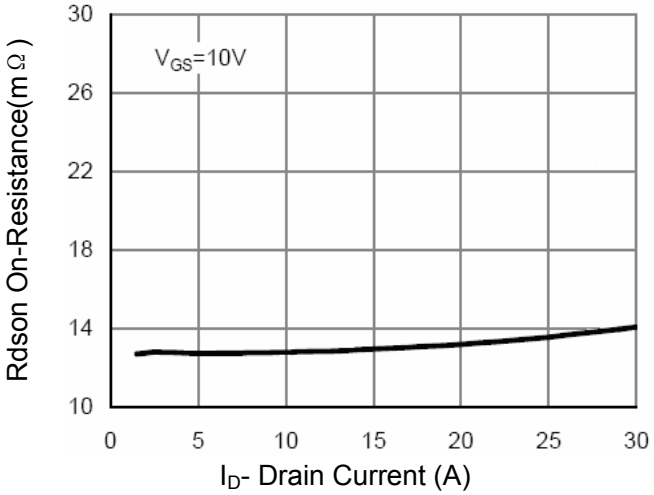


Figure 4 Rdson- Drain Current

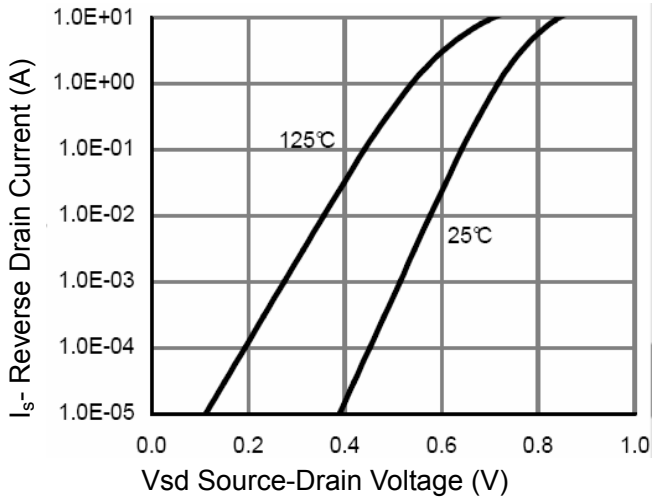


Figure 5 Source- Drain Diode Forward

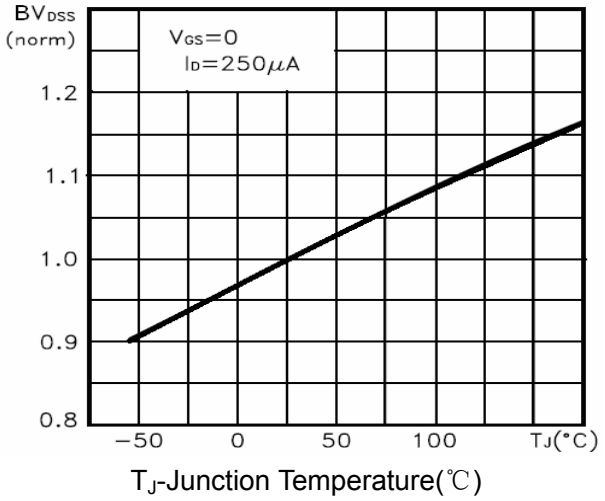


Figure 6 BV_{DSS} vs Junction Temperature

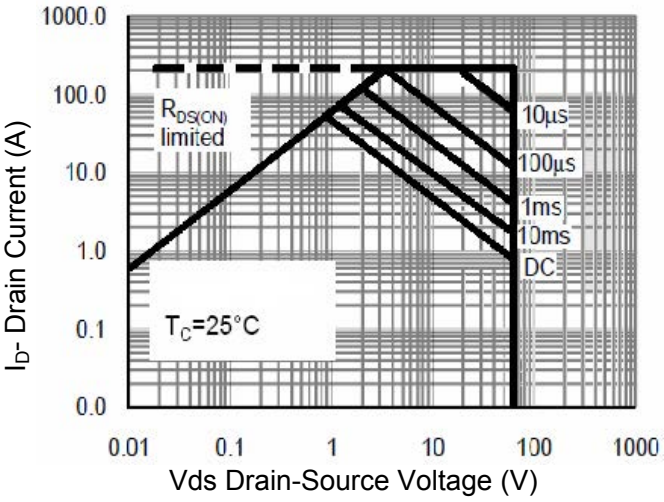


Figure 7 Safe Operation Area

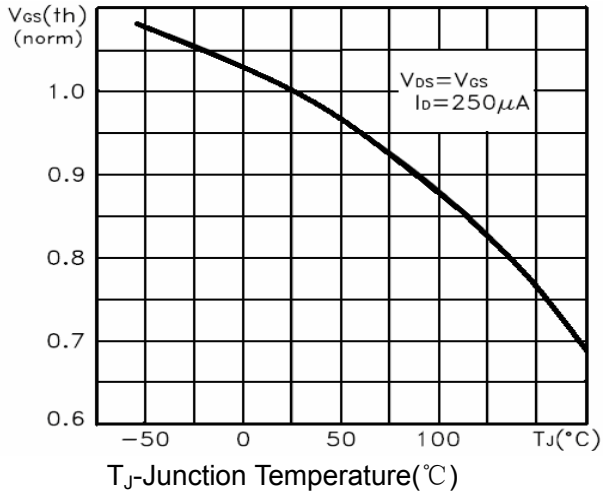
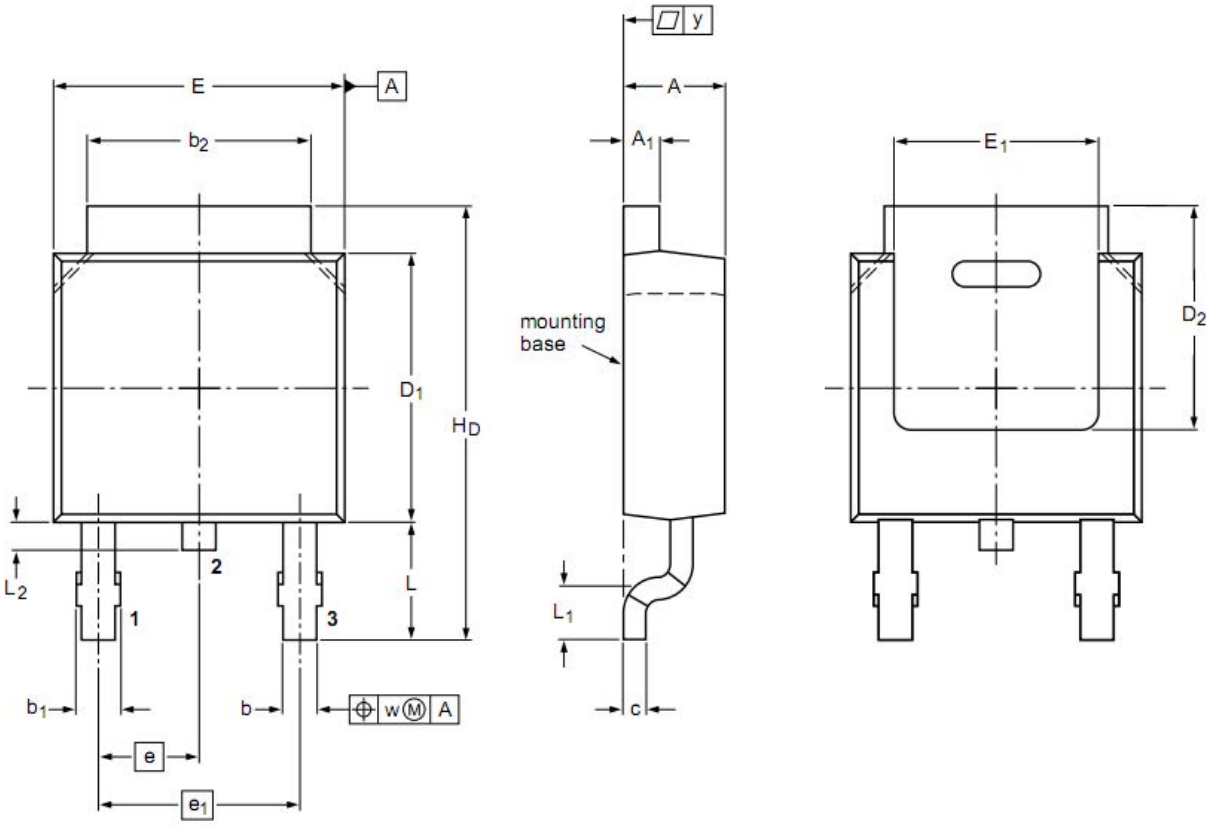


Figure 8 $V_{GS(th)}$ vs Junction Temperature

TO-252 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.38	**E_1**	4.40	--	--
A_1	0.46	0.50	0.63	**e**	2.286 BSC		
b	0.64	0.76	0.89	**e_1**	--	4.57	--
b_1	0.77	0.85	1.14	**H_D**	9.40	10.00	10.40
b_2	5.00	5.33	5.46	**L**	2.743 REF		
c	0.458	0.508	0.558	**L_1**	1.40	1.52	1.77
D_1	5.98	6.10	6.223	**L_2**	0.50	0.80	1.01
D_2	5.21	--	--	**W**	--	0.20	--
E	6.40	6.60	6.731	**y**	--	--	0.20