AT06N42IK

60V N-Channel MOSFET

Features

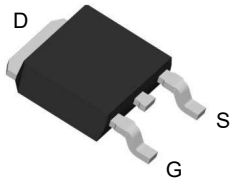
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

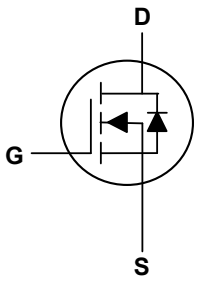
V_{DS}	60	V
I_D	42	A
$R_{DS(ON)}$ (at V_{GS}=10V)	17	mΩ
$R_{DS(ON)}$ (at V_{GS}=4.5V)	19.5	mΩ

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℃	42	A
Continuous Drain Current[1]	I_D@T_C=100℃	26	A
Pulsed Drain Current[2]	I_{DM}	104	A
Single Pulse Avalanche Energy[3]	E_{AS}	26	mJ
Avalanche Current	I_{AS}	23	A
Total Power Dissipation[4]	P_D@T_C=25℃	54	W
Total Power Dissipation[4]	P_D@T_C=100℃	22	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	$R_{\theta JA}$	---	55	℃/W
Thermal Resistance Junction-Case	$R_{\theta JC}$	---	2.3	℃/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=6A	---	14	17	mΩ
		V_{GS}=4.5V , I_D=5A	---	15	19.5	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1	1.5	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
Forward Transconductance	gfs	V_{DS}=5V , I_D=3A	---	16	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1.2	---	Ω
Total Gate Charge	Q_g	V_{DS}=30V , V_{GS}=10V , I_D=6A	---	52	---	nC
Gate-Source Charge	Q_{gs}		---	10	---	
Gate-Drain Charge	Q_{gd}		---	8	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=30V , V_{GS}=10V , R_G=6Ω, I_D=1A	---	9	---	ns
Rise Time	T_r		---	18	---	
Turn-Off Delay Time	$T_{d(off)}$		---	40	---	
Fall Time	T_f		---	30	---	
Input Capacitance	C_{iss}	V_{DS}=30V , V_{GS}=0V , f=1MHz	---	2170	---	pF
Output Capacitance	C_{oss}		---	112	---	
Reverse Transfer Capacitance	C_{rss}		---	87	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V, I_S=1A	---	0.7	1.1	V
Reverse Recovery Time	t_{rr}	I_F=1A ,V_R=0V di/dt=100A/μs，T_J=25℃	---	18	---	nS
Reverse Recovery Charge	Q_{rr}		---	11.5	---	nC

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 EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH

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

Typical Characteristics

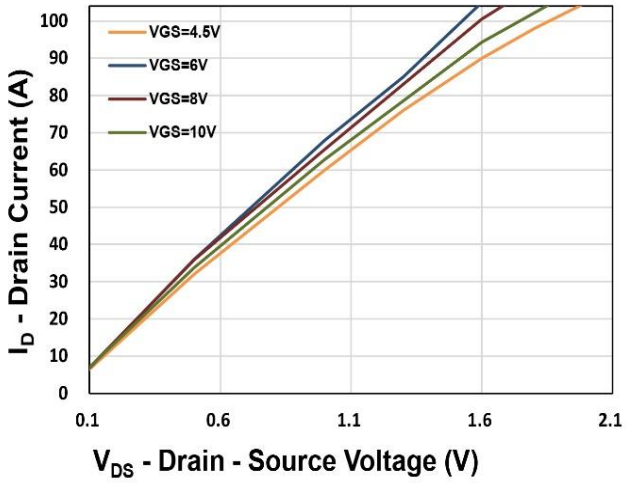


Figure 1. Output Characteristics

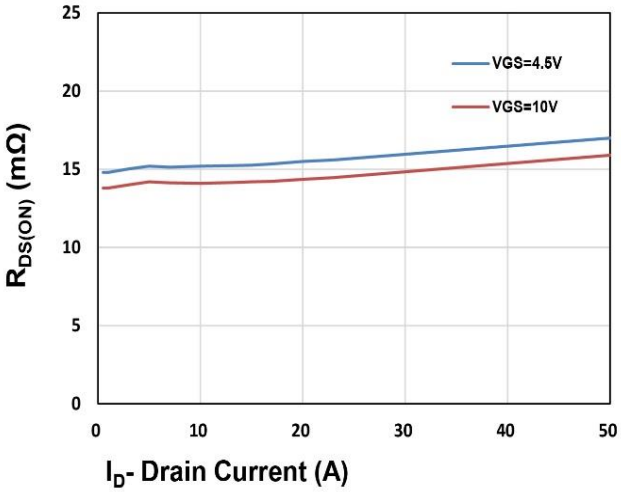


Figure 2. On-Resistance vs. ID

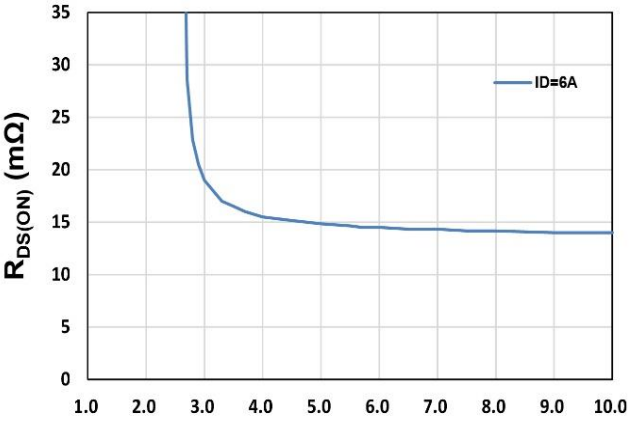


Figure 3. On-Resistance vs. VGS

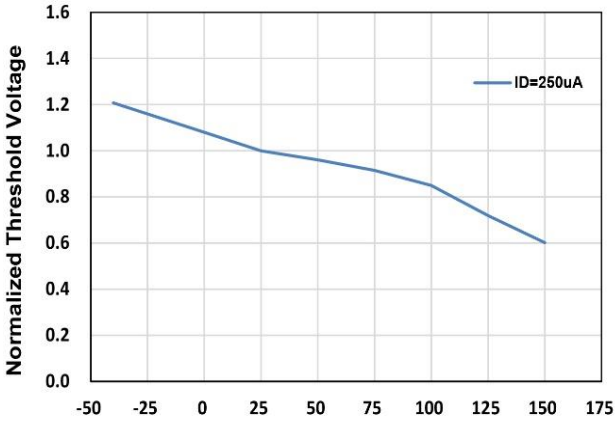


Figure 4. Gate Threshold Voltage

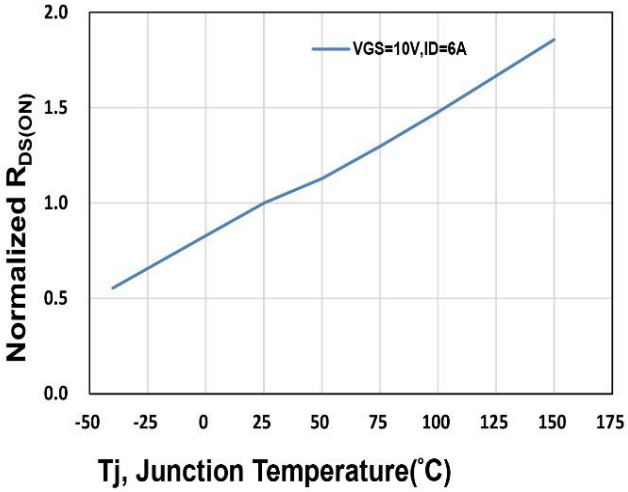


Figure 5. Drain-Source On Resistance

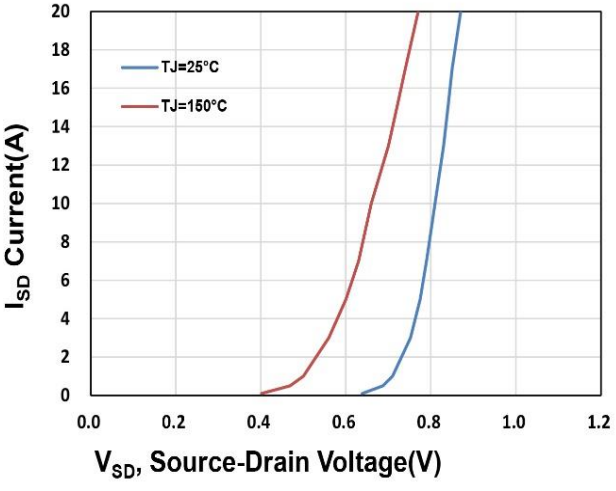


Figure 6. Source-Drain Diode Forward

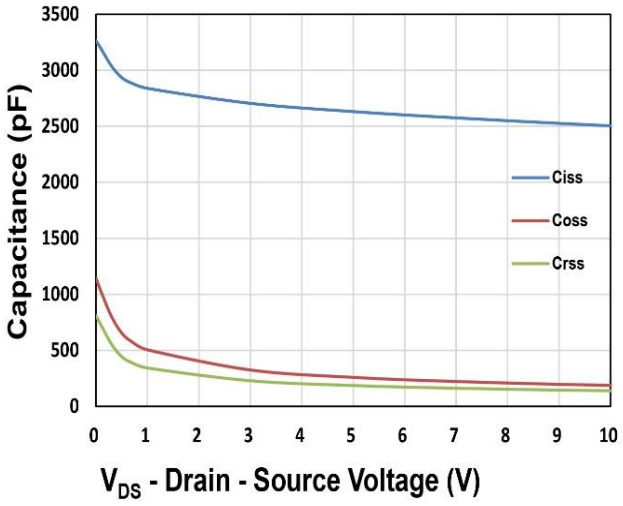


Figure 7. Capacitance

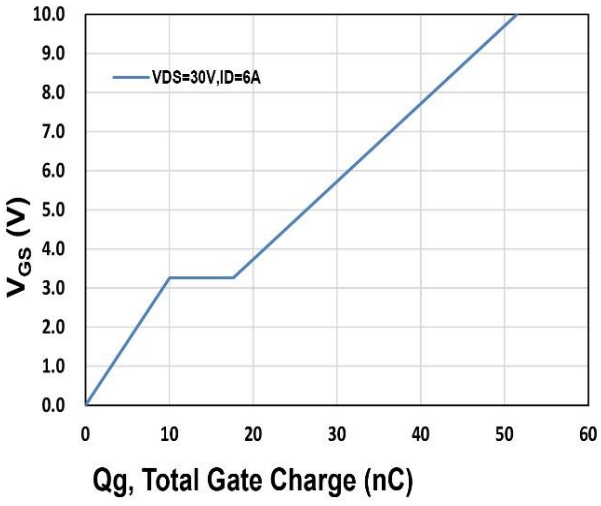


Figure 8. Gate Charge Characteristics

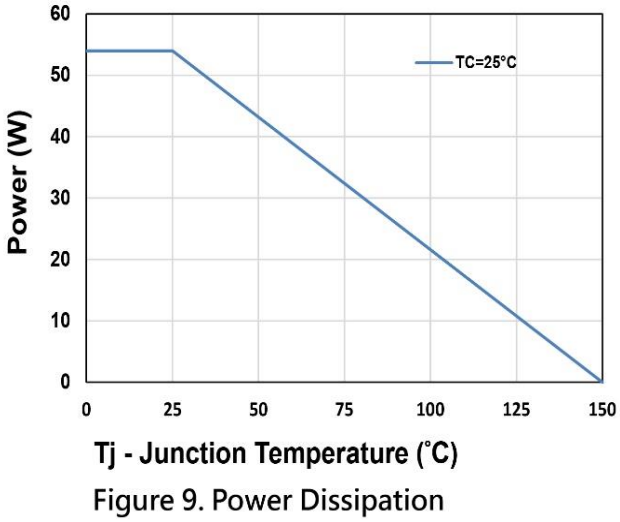


Figure 9. Power Dissipation

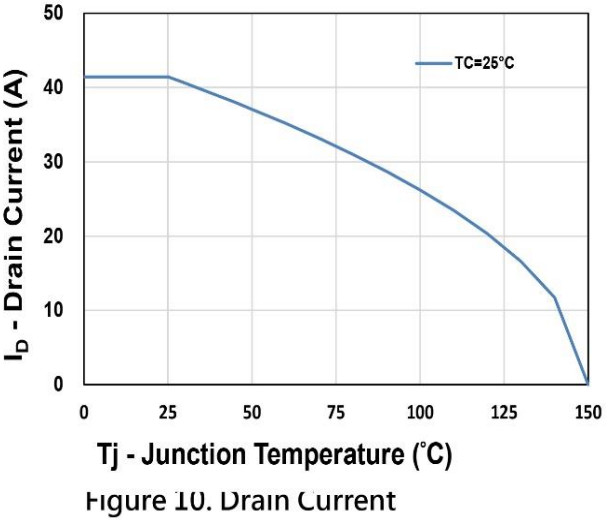


Figure 10. Drain Current

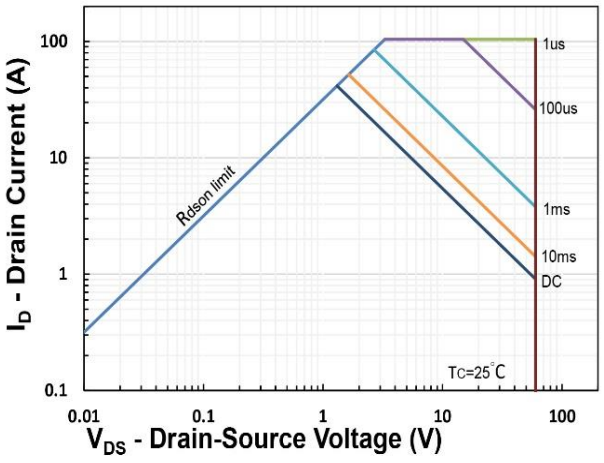


Figure 11. Safe Operating Area

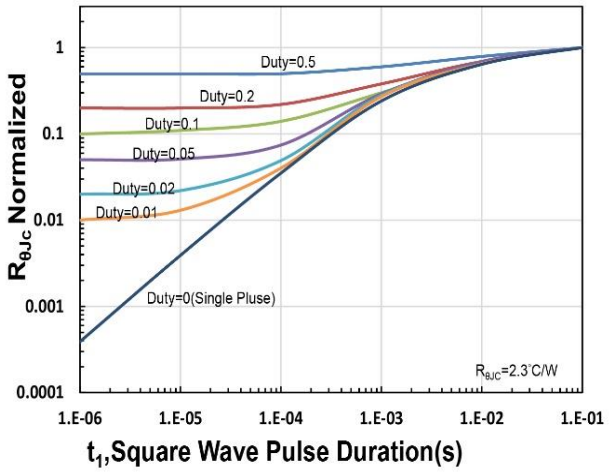
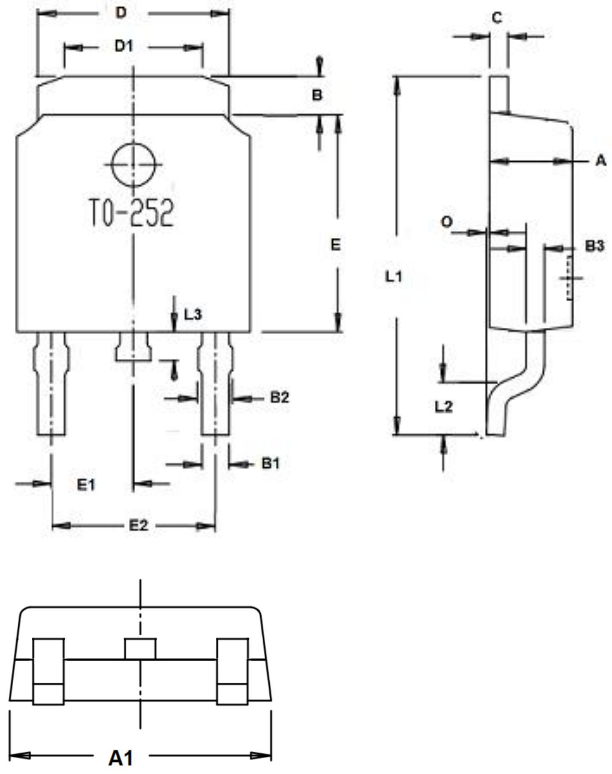


Figure 12. RθJC Transient Thermal Impedance

TO-252 Package Outline Dimensions



Dim.	Min.	Max.
A	2.1	2.5
A1	6.3	6.9
B	0.96	1.42
B1	0.74	0.86
B2	0.74	0.94
C	Typ0.5	
D	5.33	5.53
D1	3.65	4.05
E	6.0	6.2
E1	Typ2.29	
E2	Typ4.58	
O	0	0.15
L1	9.9	10.5
L2	Typ1.65	
L3	0.6	1.0
All Dimensions in millimeter		