AT4N60AS

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
600V	2.5Ω@10V	4A

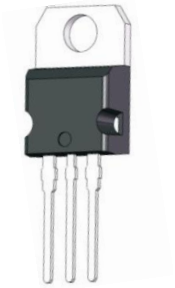
Feature

- Fast switching capability
- Low on-state resistance
- Low Gate Charge
- High rugged avalanche characteristics

Application

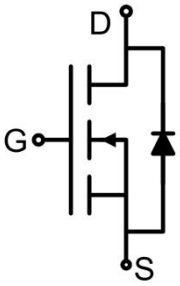
- High speed switching applications
- Power supplies and adaptors

Package

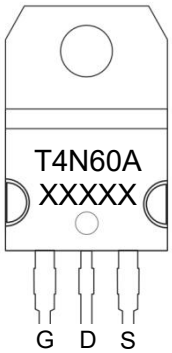


TO-220AB

Circuit diagram



Marking



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Absolute maximum ratings (T_A=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	4	A
Continuous Drain Current(T_C=100℃)	I_D(100℃)	2.5	A
Pulsed Drain Current[1]	I_{DM}	16	A
Maximum Power Dissipation (Tc=25℃)	P_D	41.6	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3	℃/W
Single pulse avalanche energy[2]	E_{AS}	173	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_a=25 ℃ unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	600			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =600V,V_{GS} =0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±30V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.0		4.0	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =2A		2.1	2.5	Ω
Transconductance	g_{FS}	V_{DS} =25V, I_D =4A		4.3		S
Dynamic characteristics[5]						
Input Capacitance	C_{iss}	V_{DS} =25V,V_{GS} =0V, f =1.0MHz		564		pF
Output Capacitance	C_{oss}			66		
Reverse Transfer	C_{rss}			12		
Intrinsic Gate Resistance	R_G	V_{DS} =0V,F_{REQ}=1MHz		1.1		Ω
Total Gate Charge[3]	Q_g	V_{DS} =480V,V_{GS} =10V, I_D =4A[3,4]		12		nC
Gate-Source Charge	Q_{gs}			4		
Gate-Drain Charge	Q_{gd}			4.8		
Turn-on delay time[3]	$t_{d(on)}$	V_{DD}=300V,I_D =4A, R_G=25Ω[3,4]		30		nS
Turn-on rise time	t_r			75		
Turn-off delay time	$t_{d(off)}$			60		
Turn-off fall time	t_f			55		
Source-Drain Diode characteristics						
Diode Forward Current	I_{SD}	T_C =25℃			4	A
Diode Forward voltage[3]	V_{SD}	V_{GS} =0V, I_{SD} =4A,			1.4	V
Reverse Recovery Time[3]	t_{rr}	I_F =4A,di/dt =100A/μs		250		nS
Reverse Recovery Charge	Q_{rr}			4.5		μC

Notes:

1) Repetitive Rating: Pulse width limited by maximum junction temperature.
2) L = 10mH, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C
3) Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
4) Essentially independent of operating temperature.
5) Guaranteed by design, not subject to production

Typical Characteristics

Fig.1 Output characteristics

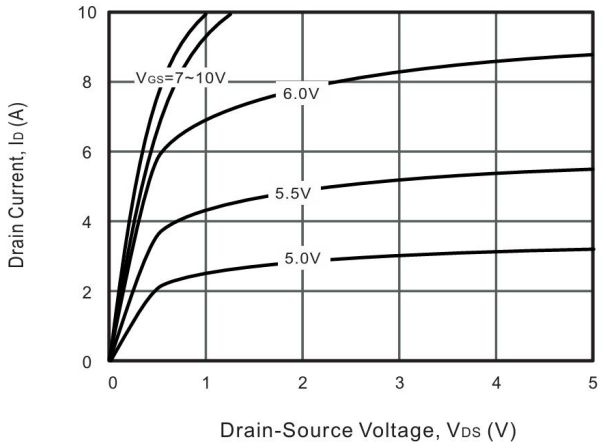


Fig.2 Power Dissipation

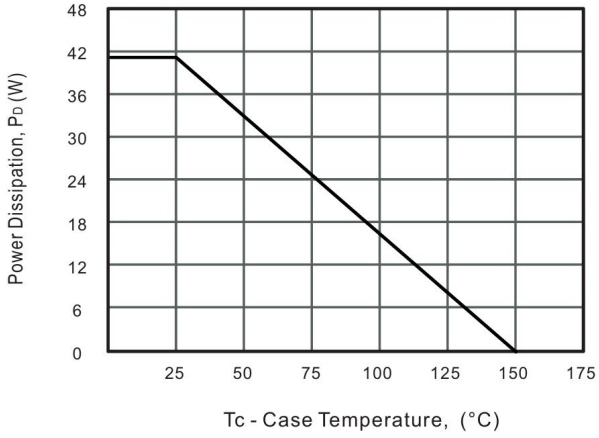


Fig.3 Drain Current Derating

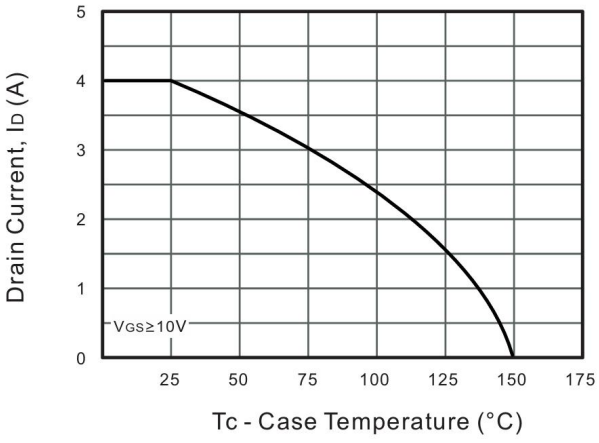


Fig.4 Drain-Source On-Resistance vs. Drain Current

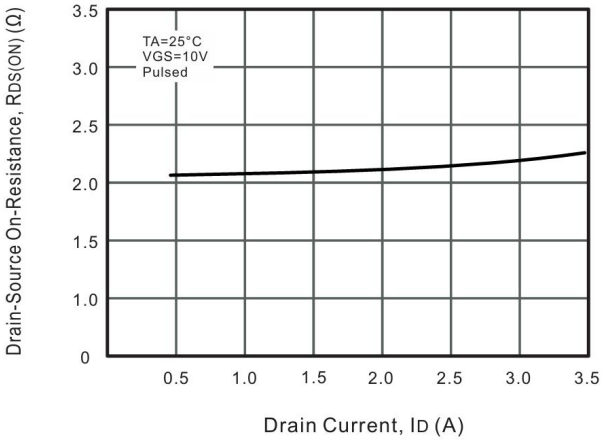


Fig.5 Gate Threshold Voltage vs. Junction Temperature

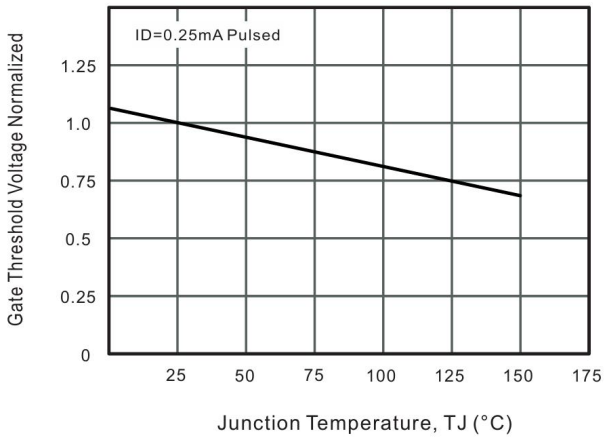
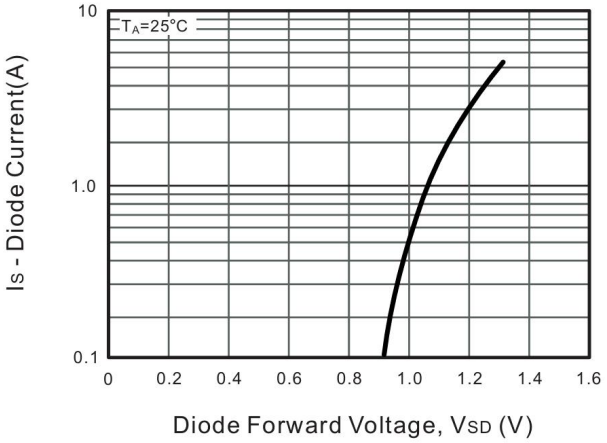


Fig.6 Body-diode Forward Characteristics



Typical Characteristics

Fig.7 Drain-Source On-Resistance vs. Junction Temperature

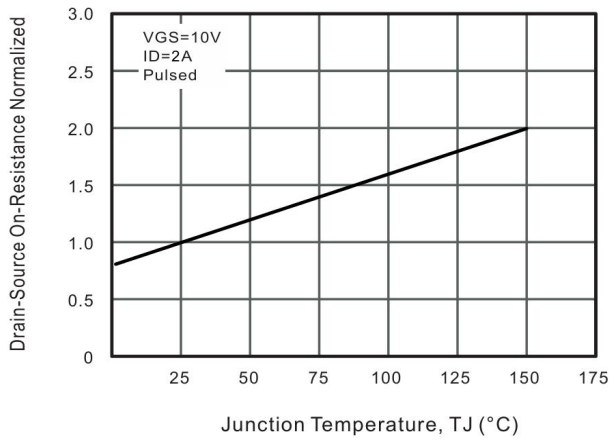


Fig.8 Breakdown Voltage vs. Junction Temperature

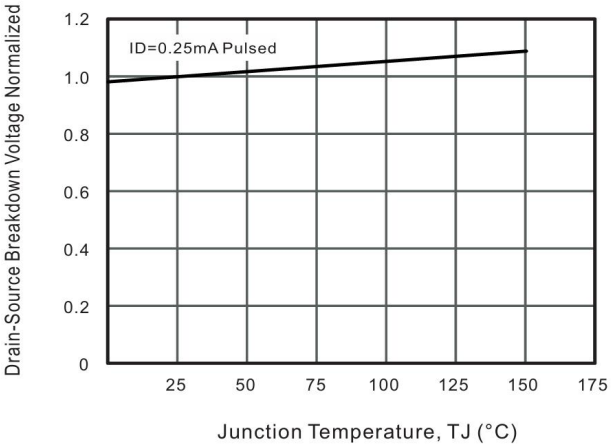


Fig.9 Capacitance Characteristics

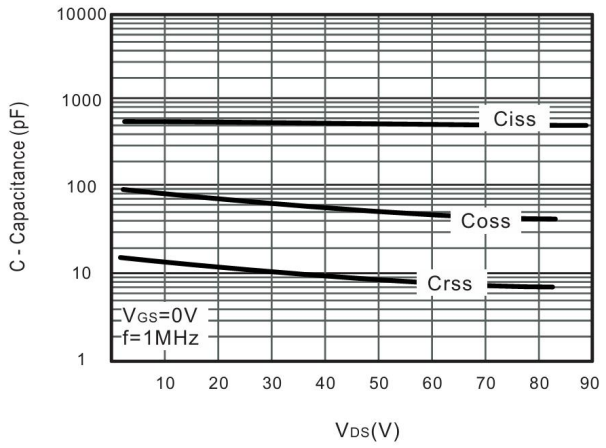


Fig.10 Gate Charge Characteristics

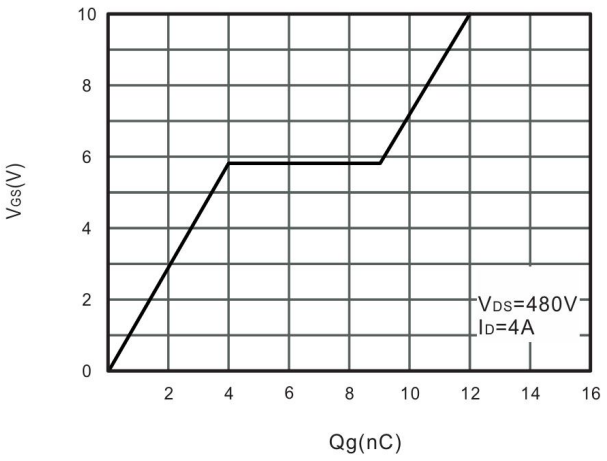


Fig.11 Safe Operating Area

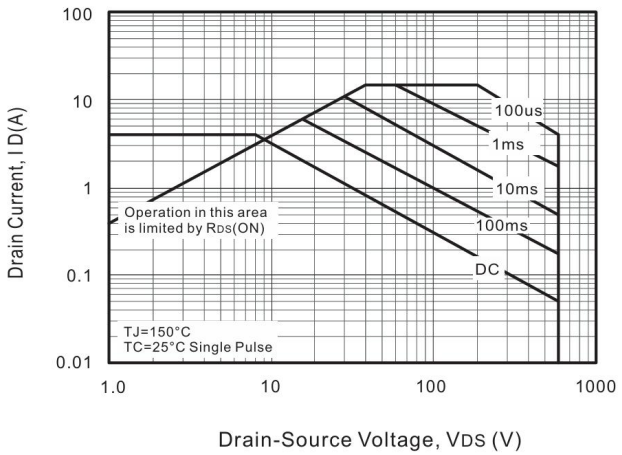
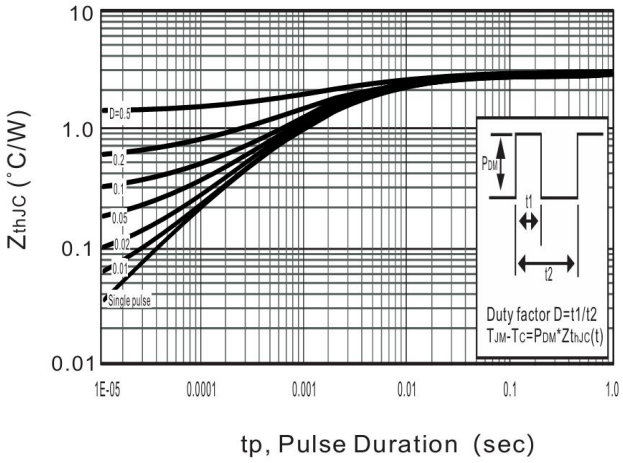
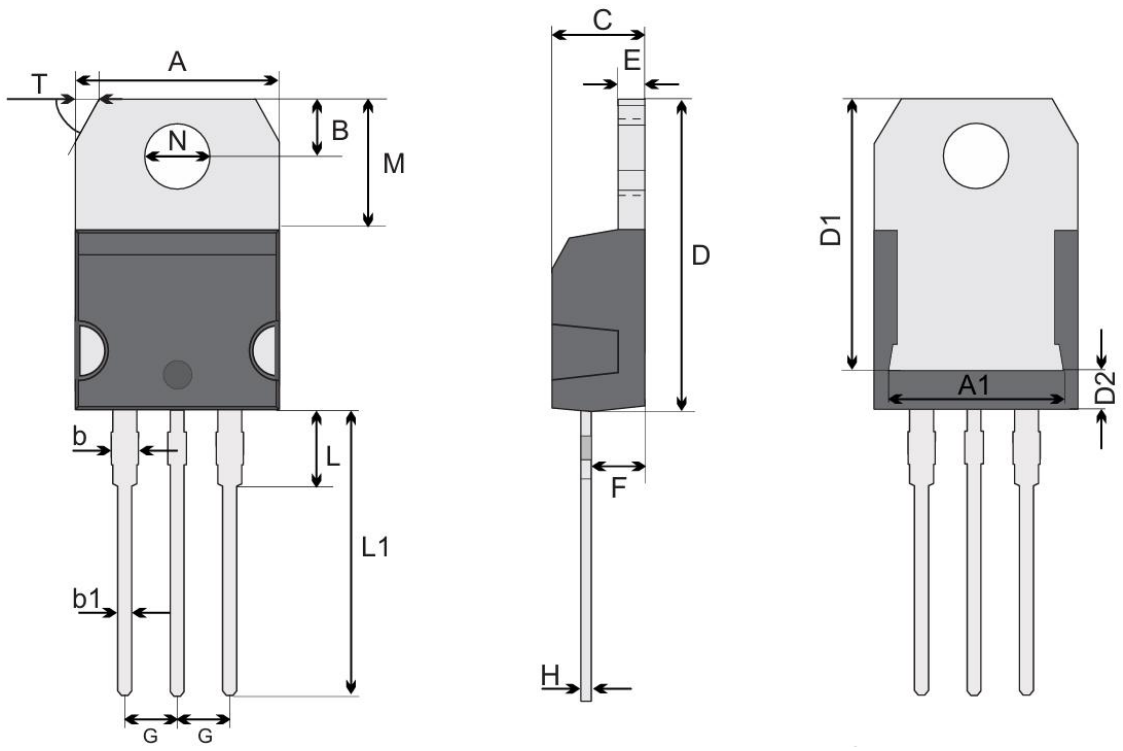


Fig.12 Max. Transient Thermal Impedance



TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	10.080	10.280	0.397	0.405
A1	9.000 REF		0.354 REF	
B	2.640	2.840	0.104	0.112
b	1.270	1.670	0.050	0.066
b1	0.700	0.900	0.028	0.035
C	4.250	4.650	0.167	0.183
D	15.140	15.540	0.596	0.612
D1	13.040 REF		0.513 REF	
D2	2.070 REF		0.082 REF	
E	1.170	1.370	0.046	0.054
F	2.390	2.790	0.094	0.110
G	2.440	2.640	0.096	0.104
H	0.400	0.600	0.016	0.024
L	3.480	3.880	0.137	0.153
L1	12.730	13.130	0.501	0.517
M	5.990	6.390	0.236	0.252
N	3.820 TYP		0.150 TYP	
T	1.190 TYP		0.047 TYP	