AT80N04S

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	8mΩ@10V	80A
	12mΩ@4.5V	

Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

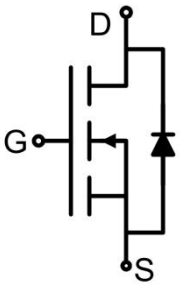
Application

- Load switching
- Hard switched and high frequency circuits
- Uninterruptible power supply

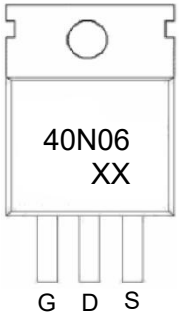
Package

TO-220AB

Circuit diagram



Marking



AT80N04S

N-Channel Enhancement Mode Power MOSFET

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	80	A
Pulsed Drain Current	I_{DM}	320	A
Power Dissipation	P_D	73	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.72	℃/W
Single pulse avalanche energy[1)]	E_{AS}	80	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25 ℃ unless otherwise noted)

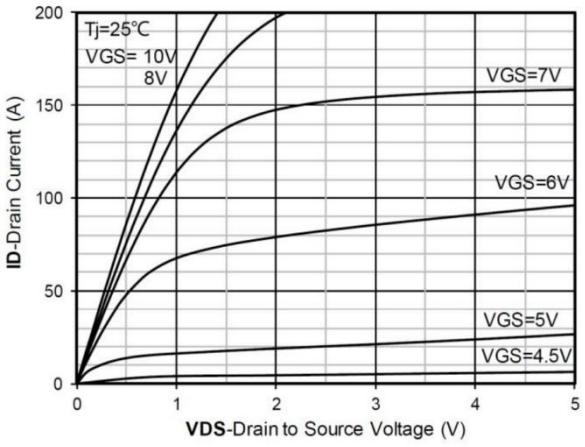
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =40V,V_{GS} = 0V			10	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±10	μA
Gate to Source Cut-off Voltage	$V_{GS(off)}$	V_{DS} =10V, I_D =1mA	1.0	1.5	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =12A		6	8	mΩ
		V_{GS} =4.5V, I_D =10A		8	12	
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =20V,V_{GS} =0V, f =1.0MHz		1730		pF
Output Capacitance	C_{oss}			280		
Reverse Transfer Capacitance	C_{rss}			190		
Total Gate Charge	Q_g	V_{DD} =20V,V_{GS} =10V,I_D =30A		29		nC
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			6.4		
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V, V_{GS} =10V, R_{GEN} =3Ω,I_D=30A, R_L =1Ω		6.4		nS
Turn-on rise time	t_r			17		
Turn-off delay time	$t_{d(off)}$			30		
Turn-off fall time	t_f			16		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_F=30A			1.2	V
Reverse Recovery Time	t_{rr}	V_{GS} =0V, I_F=20A, di/dt = 100A/μs		25		nS
Reverse Recovery Charge	Q_{rr}			22		nC

Notes:

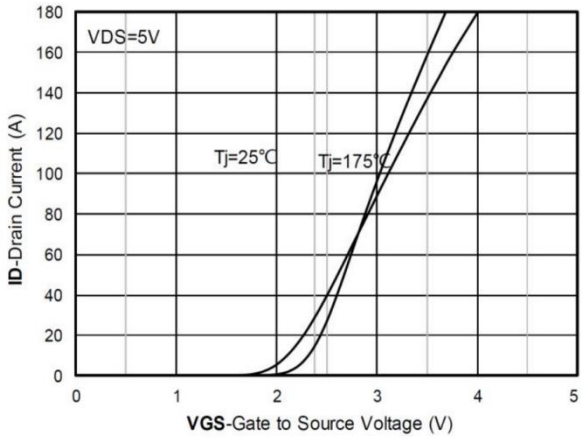
1) EAS condition：VDD=25V,VGS=10V,L=0.5mH,Rg=25Ω

2) Guaranteed by design, not subject to production.

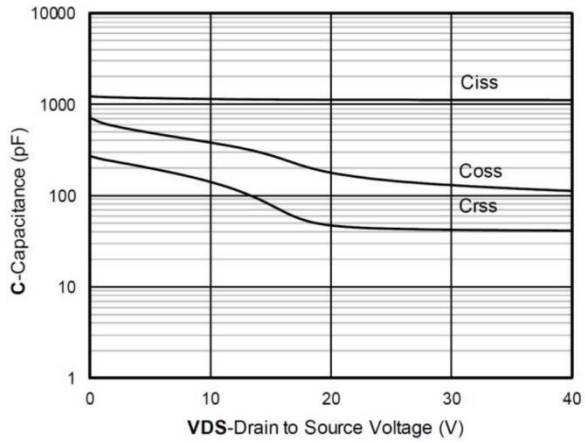
Typical Characteristics



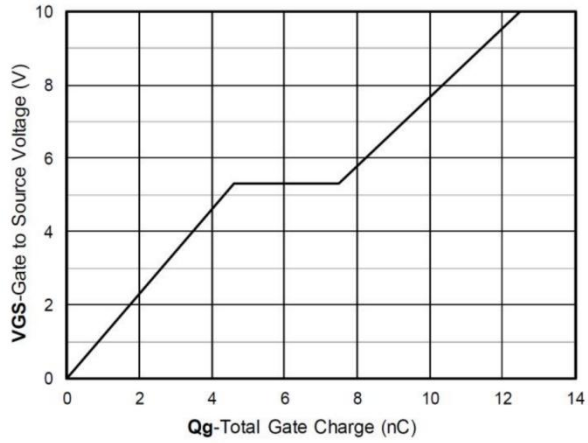
Output Characteristics



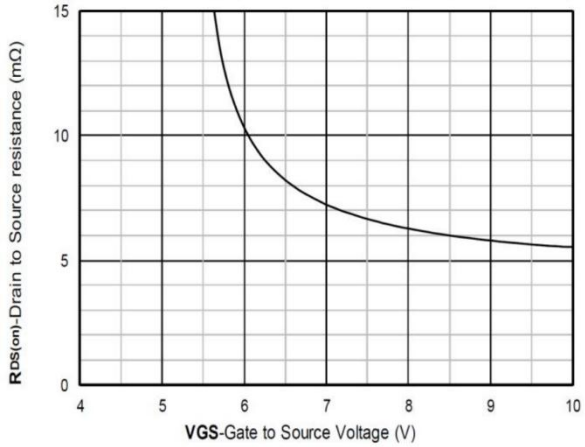
Transfer Characteristics



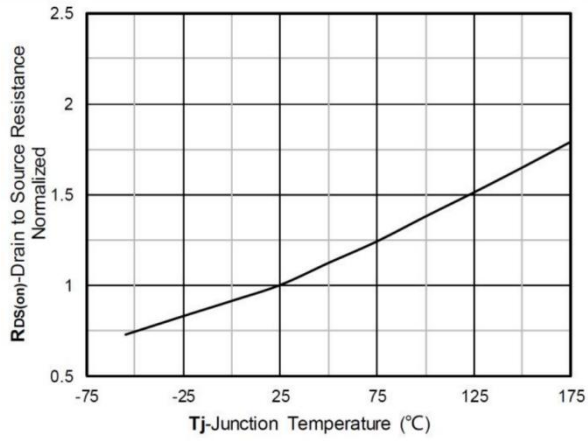
Capacitance Characteristics



Gate Charge

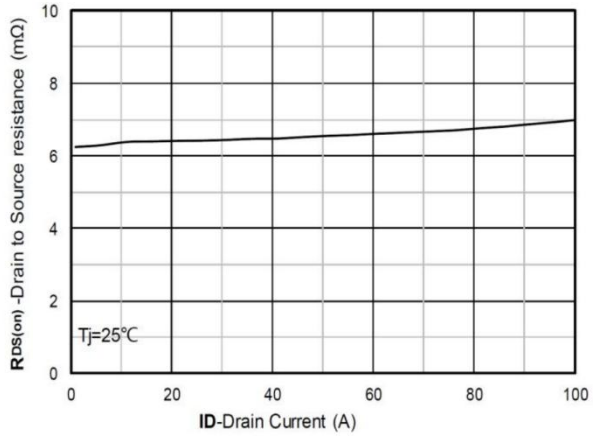


On-Resistance vs Gate to Source Voltage

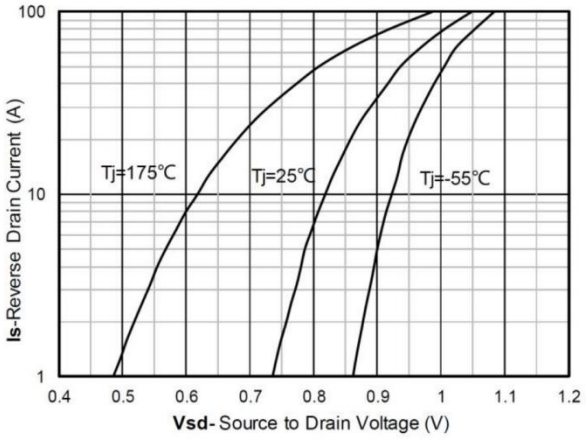


Normalized On-Resistance

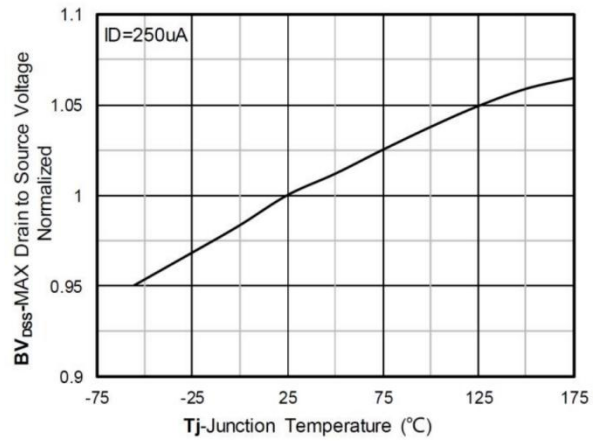
Typical Characteristics



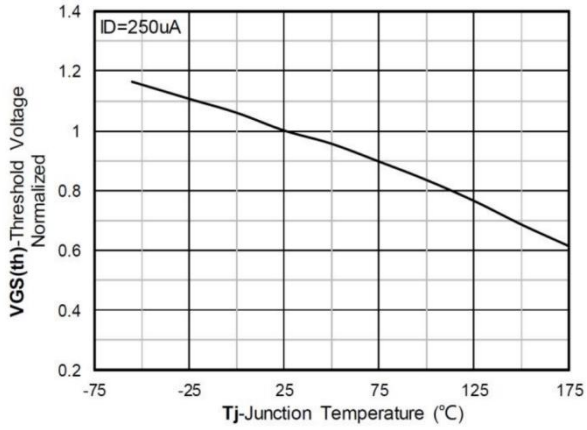
RDS(on) VS Drain Current



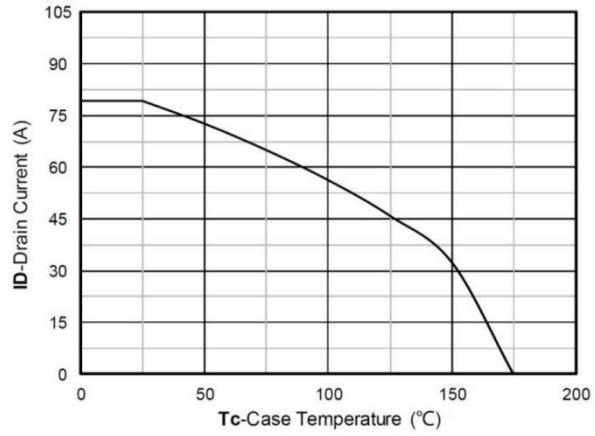
Forward characteristics of reverse diode



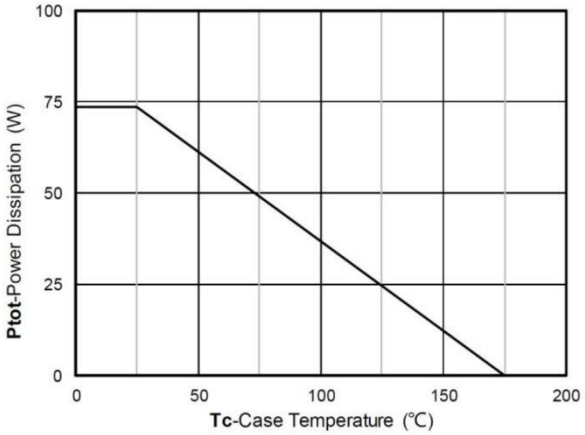
Normalized breakdown voltage



Normalized Threshold voltage

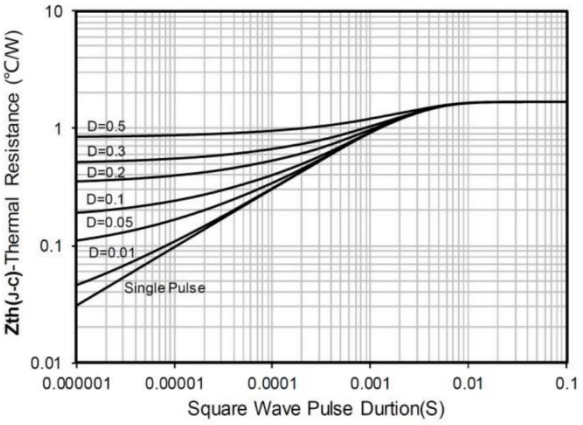


Current dissipation

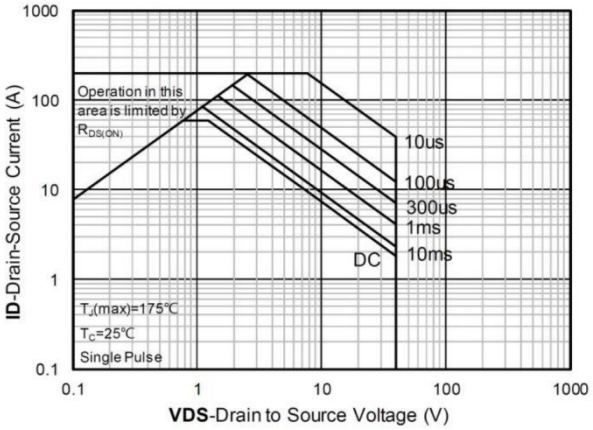


Power dissipation

Typical Characteristics

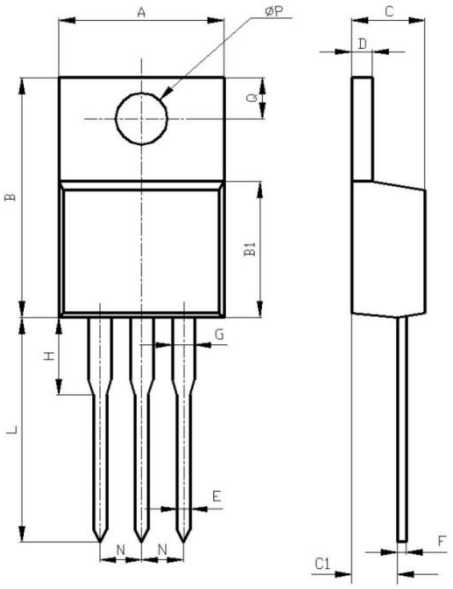


Maximum Transient Thermal Impedance



Safe Operation Area

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	10.10	10.50	0.398	0.413
B	15.20	15.60	0.598	0.614
B1	9.00	9.40	0.354	0.370
C	4.40	4.60	0.173	0.181
C1	2.40	3.00	0.094	0.118
D	1.20	1.40	0.047	0.055
E	0.70	0.90	0.028	0.035
F	0.40	0.60	0.016	0.024
G	1.17	1.37	0.046	0.054
H	3.30	3.80	0.130	0.150
L	13.10	13.70	0.516	0.539
N	2.34	2.74	0.092	0.108
Q	2.40	3.00	0.094	0.118
ΦP	3.70	3.90	0.146	0.154