AT90N10S

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	8.5mΩ@10V	90A
	12mΩ@4.5V	

Feature

- Fast Switching
- Low Gate Charge and RDSON

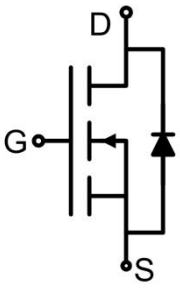
Application

- Power switching application
- DC-DC Converter
- Power Management

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}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current(T_C=25℃)	I_D	90	A
Pulsed Drain Current	I_{DM}	360	A
Power Dissipation(T_C=25℃)	P_D	130	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	0.96	℃/W
Single pulse avalanche energy[1)]	E_{AS}	358	mJ
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_a=25 ℃ unless otherwise noted)

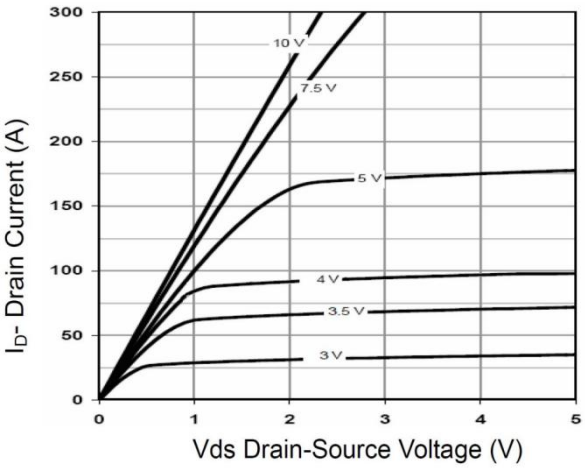
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}= 0V, I_D =250μA	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =80V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1.0	1.7	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =30A		6.7	8.5	mΩ
		V_{GS} =4.5V, I_D =25A		8.7	12	
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V, f =1.0MHz		1942		pF
Output Capacitance	C_{oss}			388		
Reverse Transfer Capacitance	C_{rss}			12		
Total Gate Charge	Q_g	V_{DS} =50V,V_{GS} =10V,I_D =30A		67		nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			21		
Turn-on delay time	$t_{d(on)}$	V_{DS}=50V, V_{GS} =10V, R_L =2.5Ω,R_G=6Ω		12		nS
Turn-on rise time	t_r			11		
Turn-off delay time	$t_{d(off)}$			42		
Turn-off fall time	t_f			6		
Source-Drain Diode characteristics						
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=1A			1.2	V

Notes:

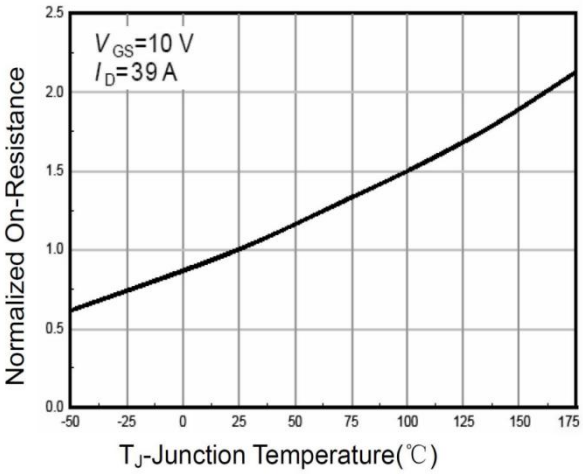
1) EAS is tested at starting Tj =25℃, VDD=50V,VGS = 10V,L = 0.5mH, Rg=25mΩ;

2) Guaranteed by design, not subject to production.

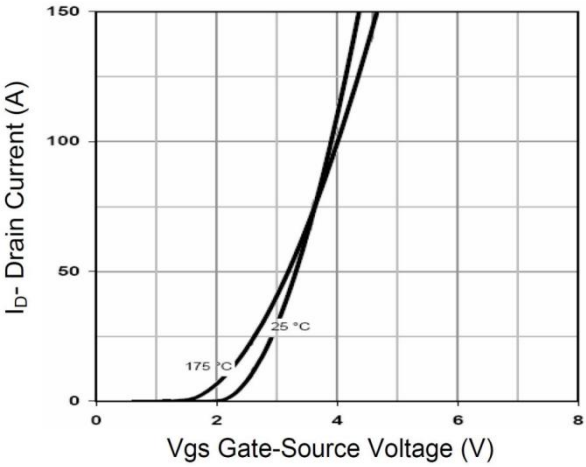
Typical Characteristics



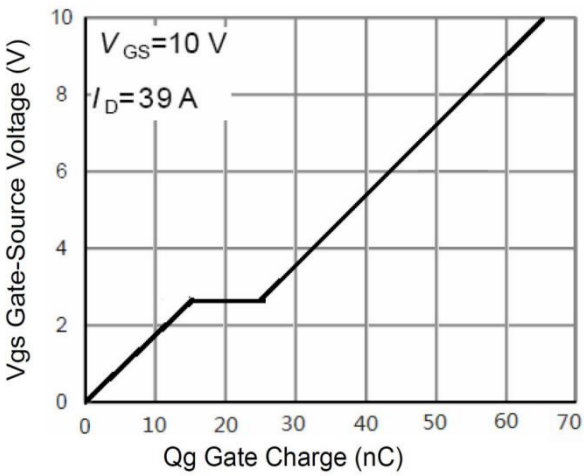
Output Characteristics



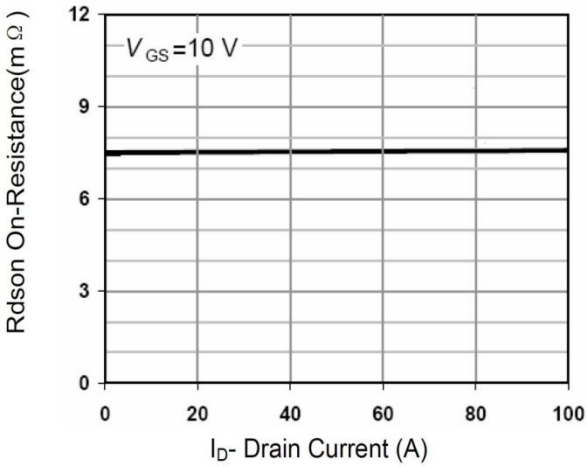
Rdson-JunctionTemperature



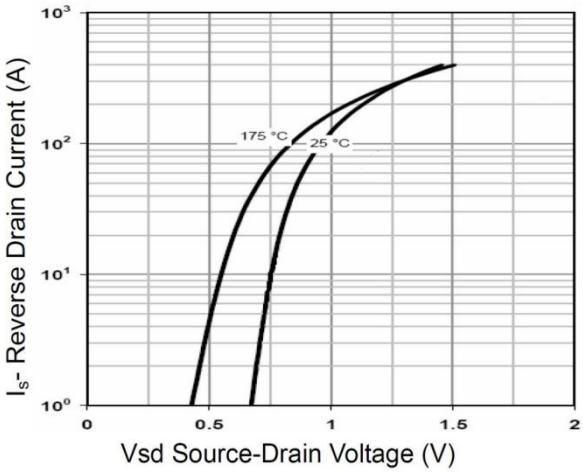
Transfer Characteristics



Gate Charge

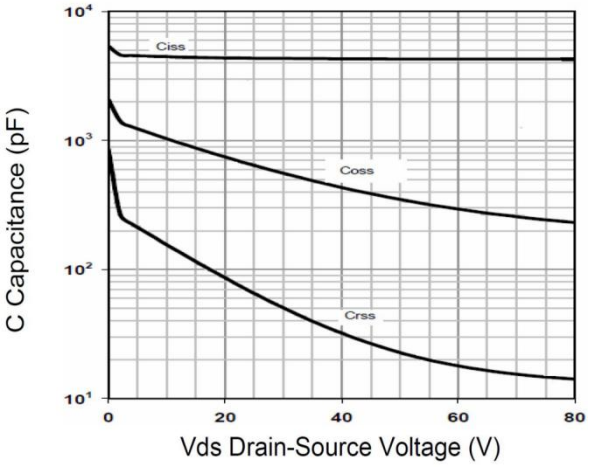


Rdson- Drain Current

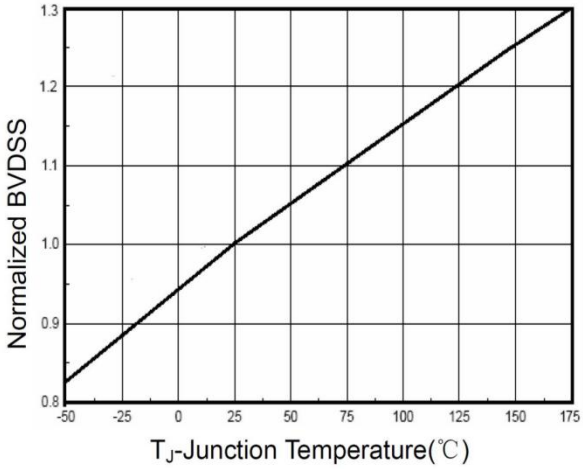


Source- Drain Diode Forward

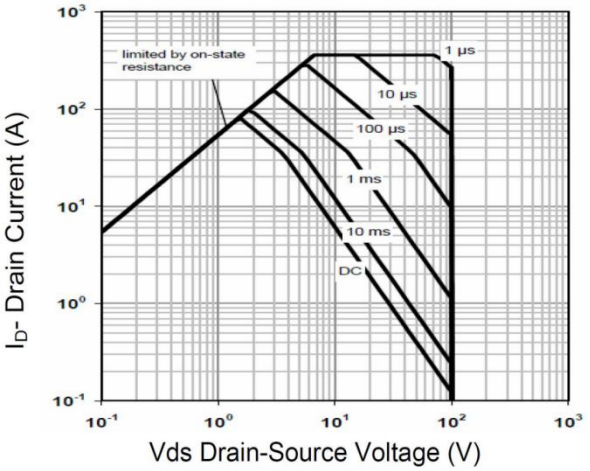
Typical Characteristics



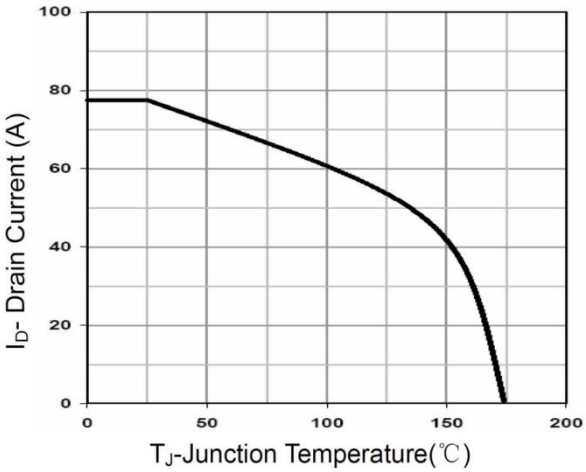
Capacitance vs Vds



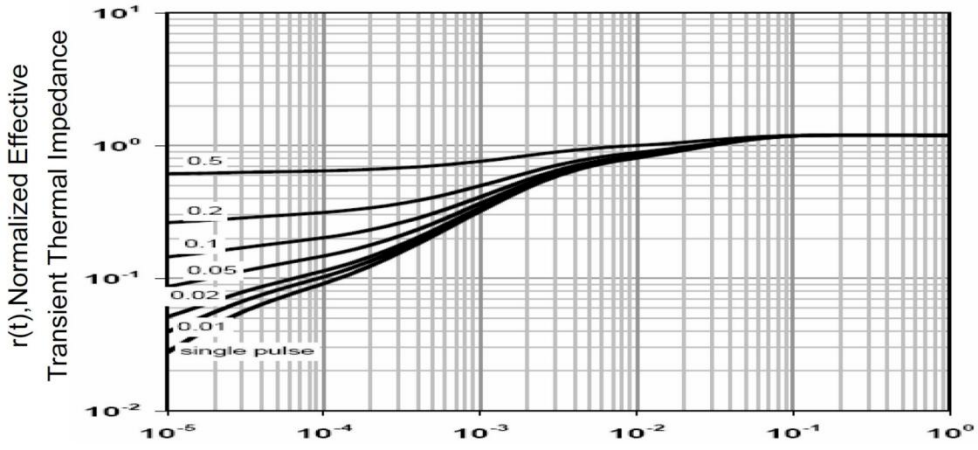
BV_{DSS} vs Junction Temperature



Safe Operation Area

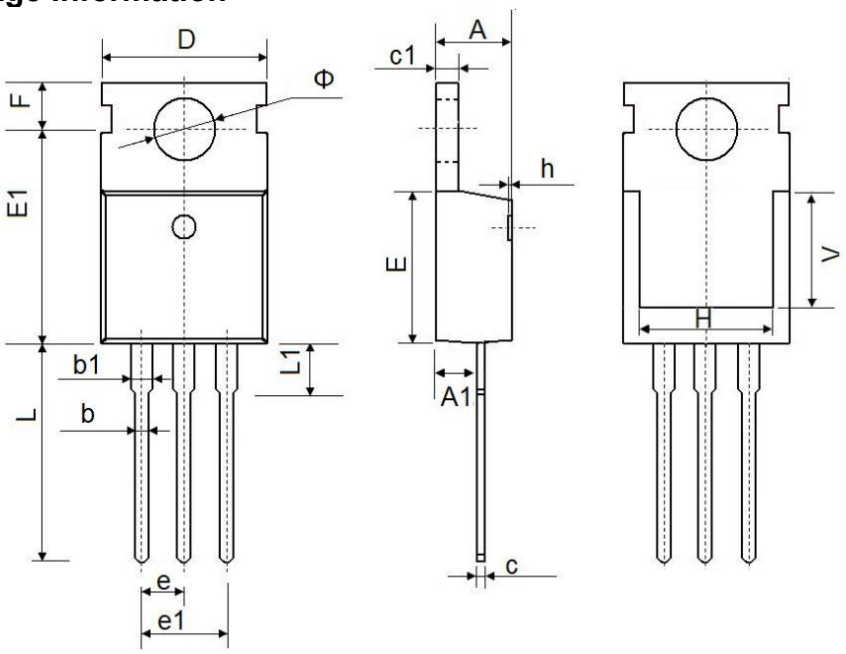


Current De-rating



Normalized Maximum Transient Thermal Impedance

TO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	13.050	0.498	0.514
e	2.540 TYP		0.100 TYP	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	6.900 REF		0.276 REF	
Φ	3.400	3.800	0.134	0.150