AT150N06AS-Q1

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	3.1mΩ@10V	150A

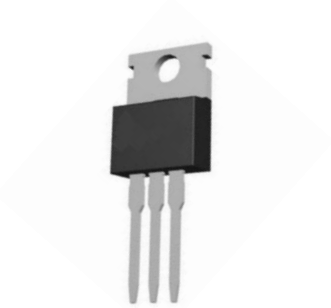
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability
- Suffix "-Q1" for AEC-Q101

Application

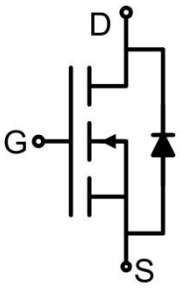
- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply

Package



TO-220AB

Circuit diagram



Marking

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	150	A
Continuous Drain Current(T_C=100℃)	I_D(100℃)	105	A
Pulsed Drain Current	I_{DM}	600	A
Power Dissipation	P_D	220	W
Thermal Resistance,Junction-to-Case[1)]	$R_{\theta JC}$	0.68	℃/W
Single pulse avalanche energy[4)]	E_{AS}	1600	mJ
Junction Temperature	T_J	175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

Electrical characteristics (T_C=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	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =60V,V_{GS} = 0V			1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±20V, V_{DS} = 0V			±100	nA
Gate threshold voltage[2)]	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.0	3.0	4.0	V
Drain-source on-resistance[2)]	$R_{DS(on)}$	V_{GS} =10V, I_D =75A		2.8	3.1	mΩ
Dynamic characteristics[3)]						
Input Capacitance	C_{iss}	V_{DS} =30V,V_{GS} =0V, f =1.0MHz		7872		pF
Output Capacitance	C_{oss}			634		
Reverse Transfer Capacitance	C_{rss}			502		
Total Gate Charge	Q_g	V_{DS} =30V,V_{GS} =10V,I_D =75A		152		nC
Gate-Source Charge	Q_{gs}			33		
Gate-Drain Charge	Q_{gd}			55		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V, V_{GS} =10V, R_L =0.4Ω,R_G=2.5Ω		25		nS
Turn-on rise time	t_r			23		
Turn-off delay time	$t_{d(off)}$			90		
Turn-off fall time	t_f			38		
Source-Drain Diode characteristics						
Diode Forward Current[1)]	I_S				150	A
Diode Forward voltage[2)]	V_{SD}	V_{GS} =0V, I_S=75A			1.2	V
Reverse Recovery Time	T_{rr}	T_J = 25°C, I_F =75A di/dt = 100A/μs[2)]		60		nS
Reverse Recovery Charge	Q_{rr}			80		nC

Notes:

1) Surface Mounted on FR4 Board, t ≤ 10 sec.
2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
3) Guaranteed by design, not subject to production.
4) EAS condition：Tj=25℃,VDD=30V,VG=10V,L=0.5mH,Rg=25Ω.

Typical Characteristics

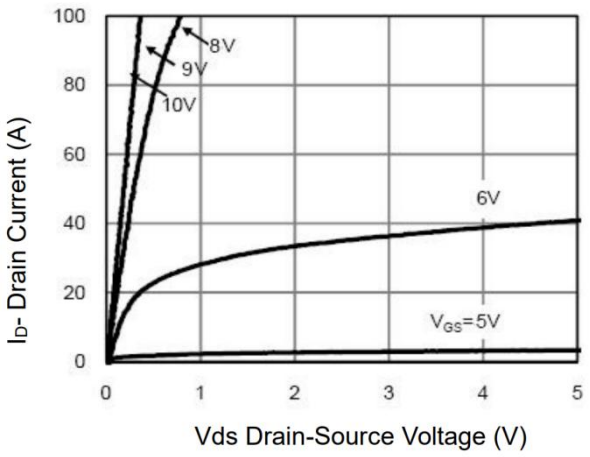

Figure 1 Output Characteristics

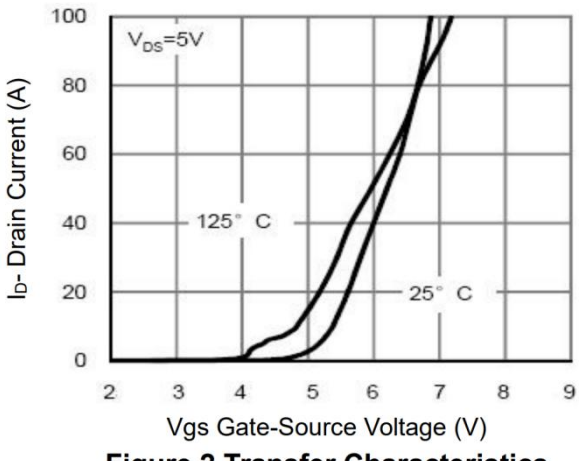

Figure 2 Transfer Characteristics

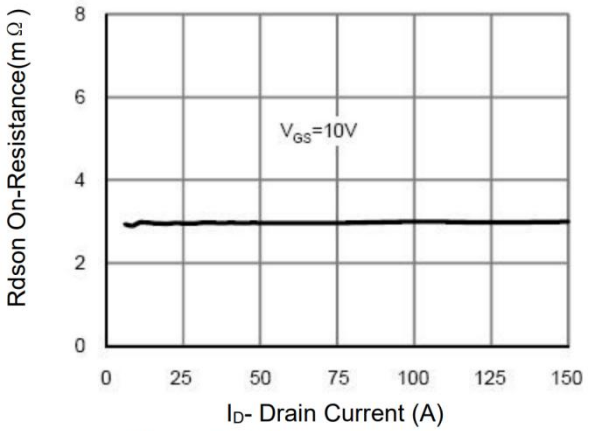

Figure 3 Rdson- Drain Current

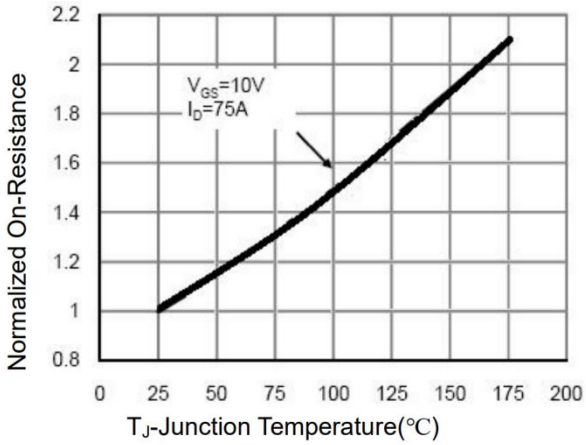

Figure 4 Rdson-JunctionTemperature

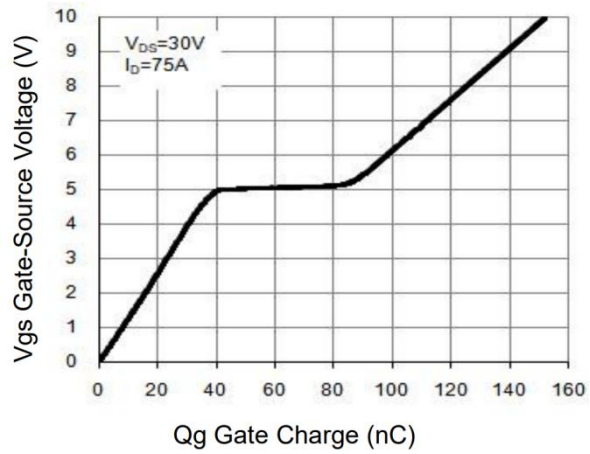

Figure 5 Gate Charge

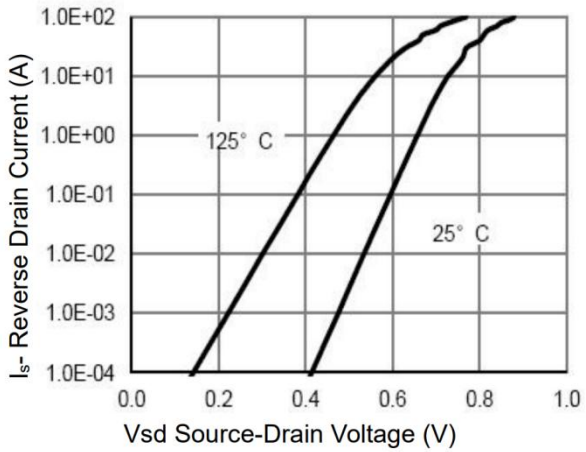

Figure 6 Source- Drain Diode Forward

Typical Characteristics

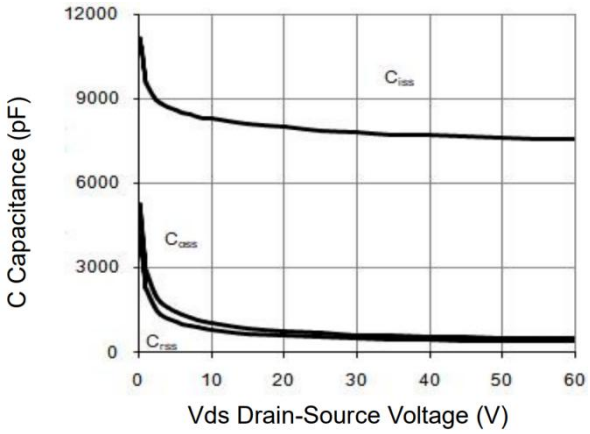

Figure 7 Capacitance vs Vds

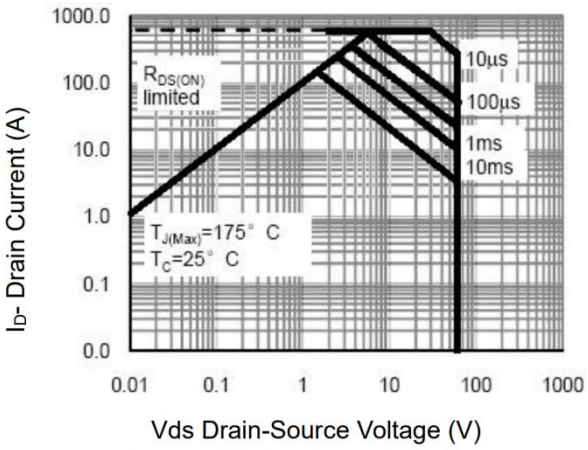

Figure 8 Safe Operation Area

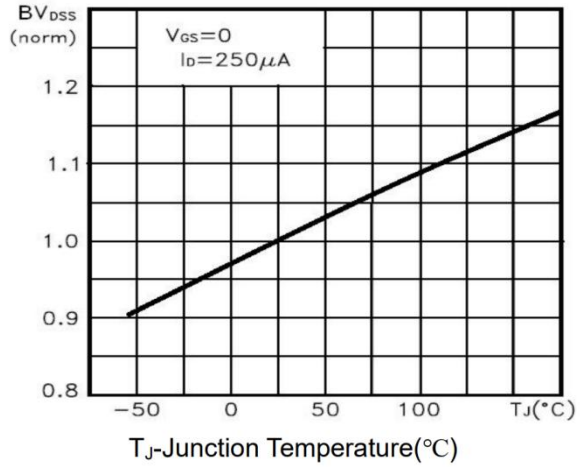

Figure 9 BV_{DSS} vs Junction Temperature

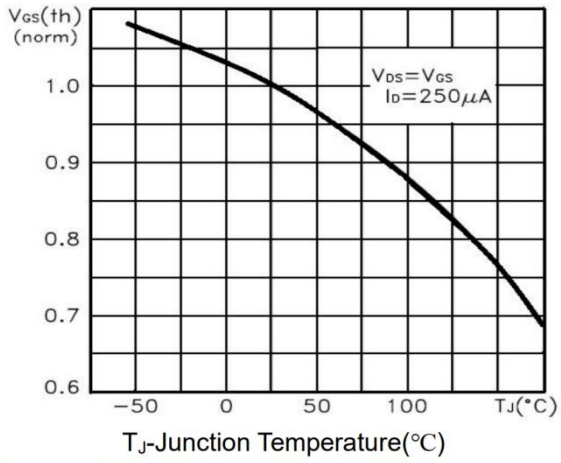

Figure 10 $V_{GS(th)}$ vs Junction Temperature

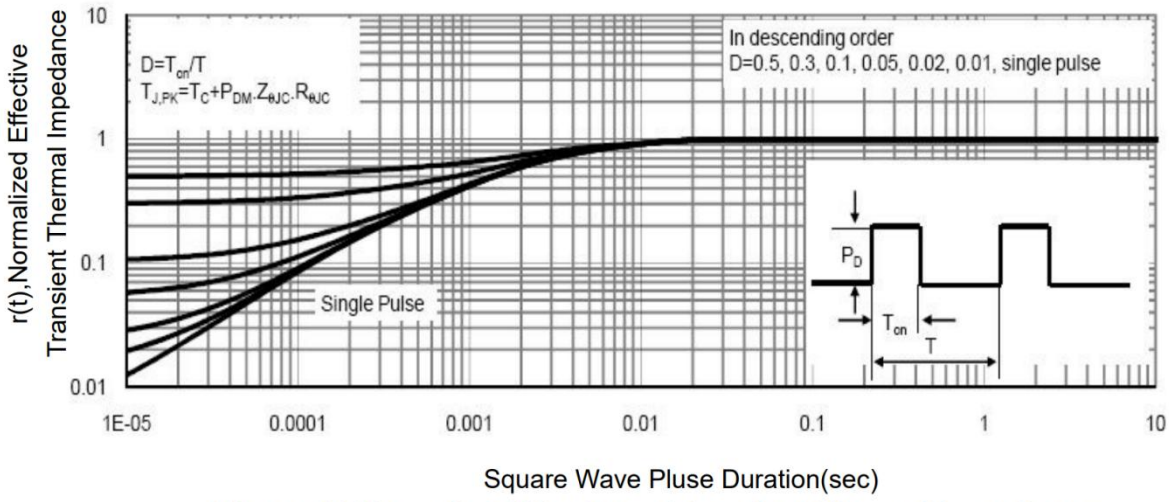

Figure 11 Normalized Maximum Transient Thermal Impedance

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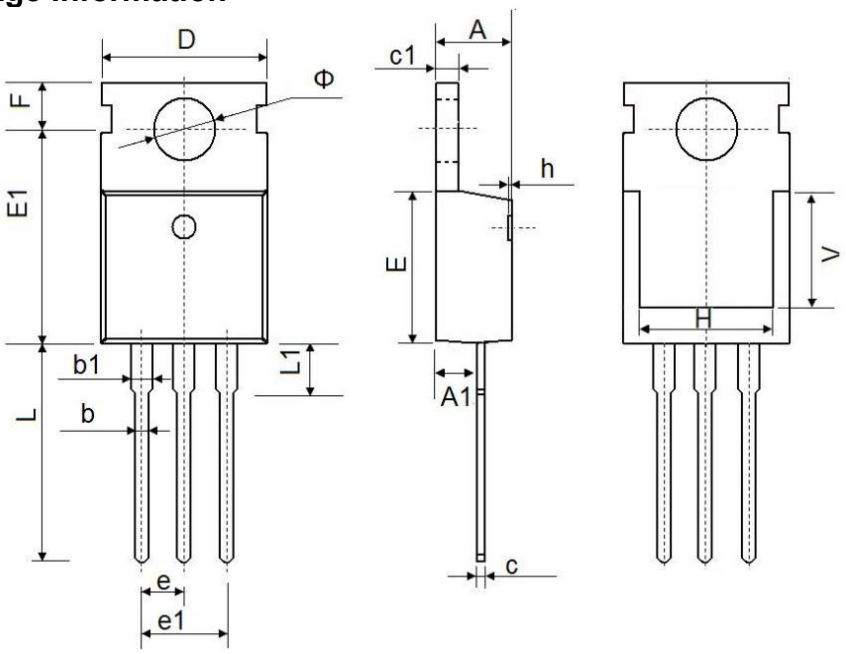
TO-220AB Package Information



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	12.950	0.498	0.510
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	7.500 REF		0.295 REF	
Φ	3.400	3.800	0.134	0.150