AG078SN100MTA-Q1

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
100V	8.5mΩ@10V	78A
	12.0mΩ@4.5V	

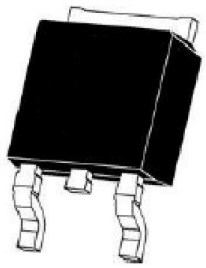
Feature

- Excellent gate charge x $R_{DS(on)}$ product (FOM)
- Very low on-resistance $R_{DS(on)}$
- Suffix “-Q1” for AEC-Q101

Application

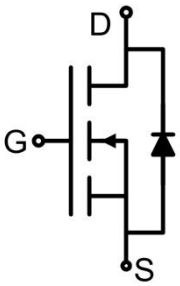
- DC/DC Converter
- Ideal for high-frequency switching and synchronous rectification

Package



TO-252AB

Circuit diagram



Marking

Absolute maximum ratings (T_C=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	I_D	78	A
Continuous Drain Current (T_C=100℃)	I_D(100℃)	60	A
Pulsed Drain Current	I_{DM}	320	A
Power Dissipation	P_D	125	W
Thermal Resistance,Junction-to-Case[1)]	$R_{\theta JC}$	1.2	℃/W
Single pulse avalanche energy[3)]	E_{AS}	320	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	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =100V,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	1.2	1.7	2.2	V
Drain-source on-resistance[2)]	$R_{DS(on)}$	V_{GS} =10V, I_D =39A		7.2	8.5	mΩ
		V_{GS} =4.5V, I_D =39A		9.5	12.0	
Forward transconductance[2)]	g_{FS}	V_{DS} =10V, I_D =39A	40			S
Dynamic characteristics[4)]						
Input Capacitance	C_{iss}	V_{DS} =50V,V_{GS} =0V,f =1MHz		4200		pF
Output Capacitance	C_{oss}			354		
Reverse Transfer Capacitance	C_{rss}			23		
Total Gate Charge	Q_g	V_{DS} =50V,V_{GS} =10V,I_D =39A		65		nC
Gate-Source Charge	Q_{gs}			15.3		
Gate-Drain Charge	Q_{gd}			9		
Turn-on delay time	$t_{d(on)}$	V_{DD}=50V,V_{GS}=10V, I_D =39A,R_G=4.7Ω		15		nS
Turn-on rise time	t_r			10		
Turn-off delay time	$t_{d(off)}$			41		
Turn-off fall time	t_f			6		
Source-Drain Diode characteristics						
Diode Forward Current[1)]	I_S				78	A
Diode Forward voltage[2)]	V_{DS}	V_{GS} =0V, I_S=78A			1.2	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =I_S di/dt =100A/μs [2)]		101		nS
Reverse Recovery Charge	Q_{rr}			193		nC

Notes:

1) Surface Mounted on FR4 Board, t ≤ 10 sec.

2) Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

3) EAS condition : Tj=25℃ ,V_{DD}=50V,V_G=10V,L=0.5mH,Rg=25Ω

4) Guaranteed by design, not subject to production.

Typical Characteristics

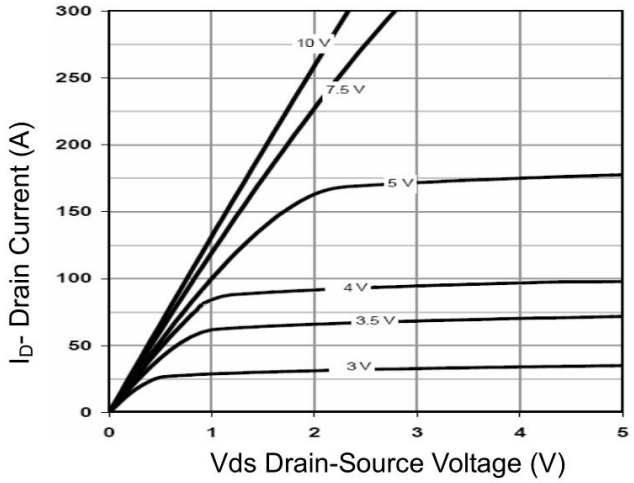


Figure 1 Output Characteristics

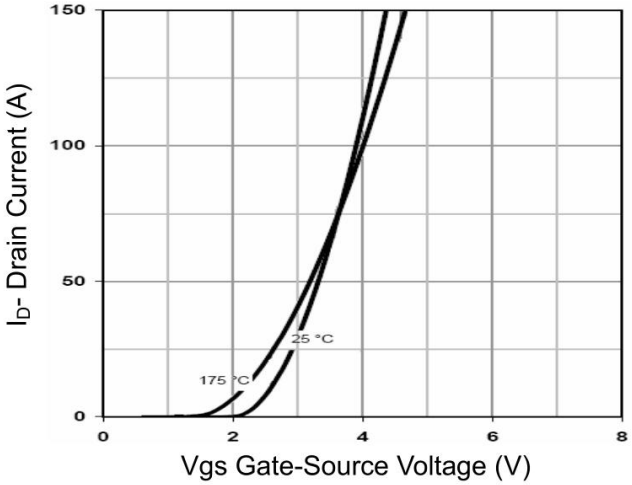


Figure 2 Transfer Characteristics

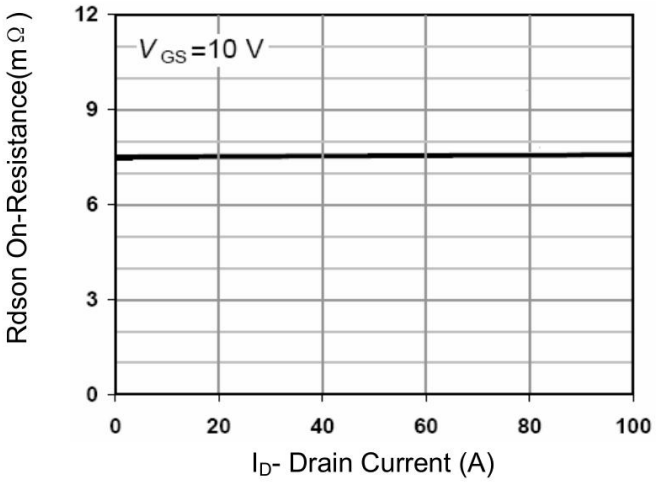


Figure 3 Rdson- Drain Current

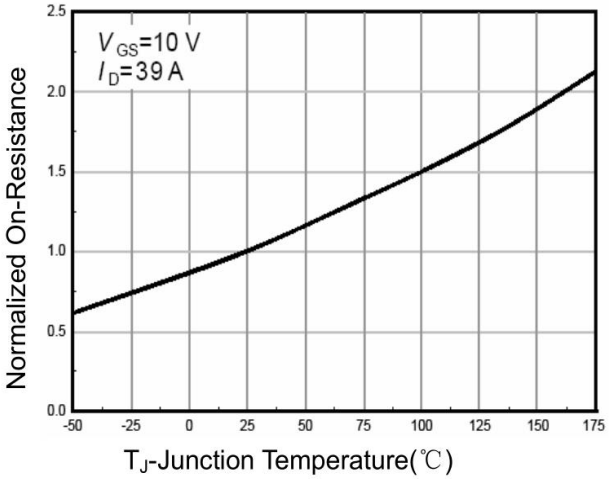


Figure 4 Rdson-JunctionTemperature

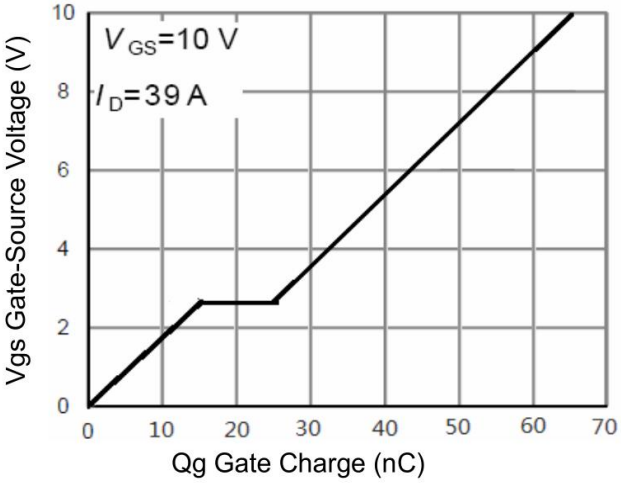


Figure 5 Gate Charge

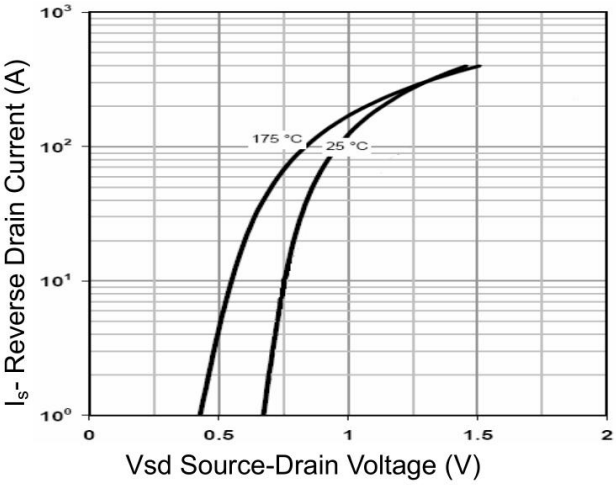


Figure 6 Source- Drain Diode Forward

Typical Characteristics

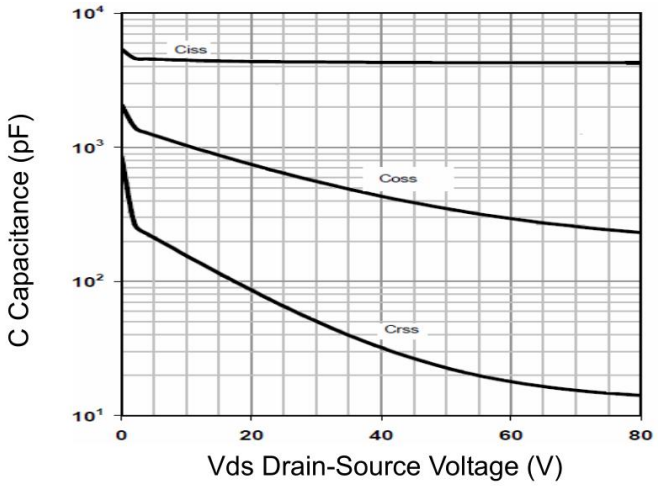


Figure 7 Capacitance vs Vds

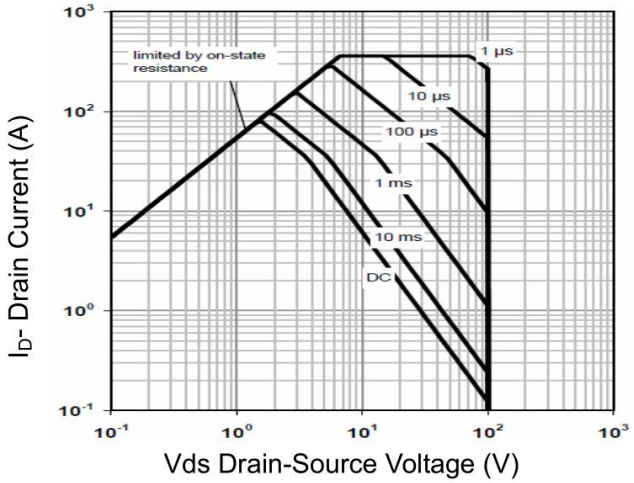


Figure 8 Safe Operation Area

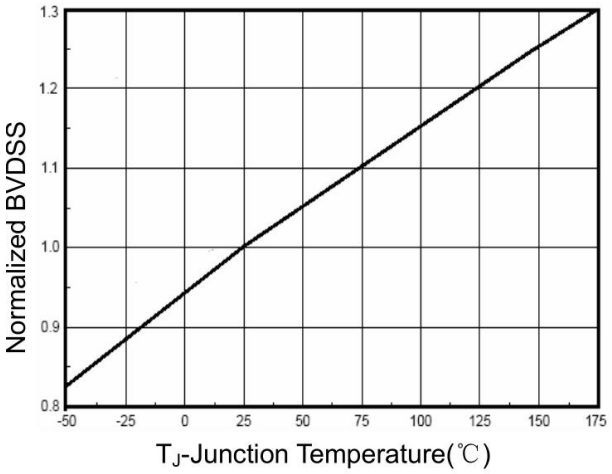


Figure 9 BV_{DSS} vs Junction Temperature

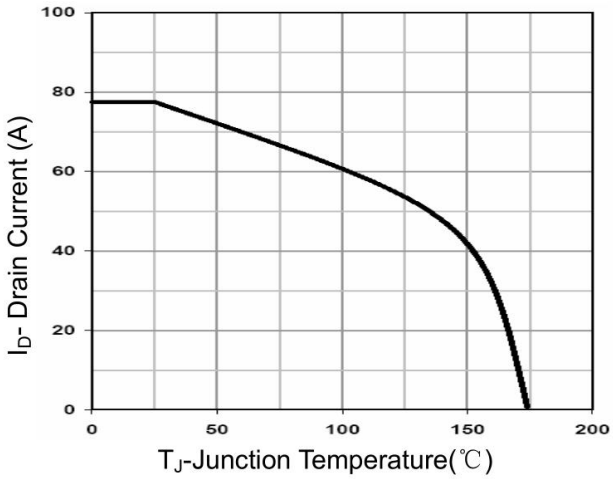


Figure 10 Current De-rating

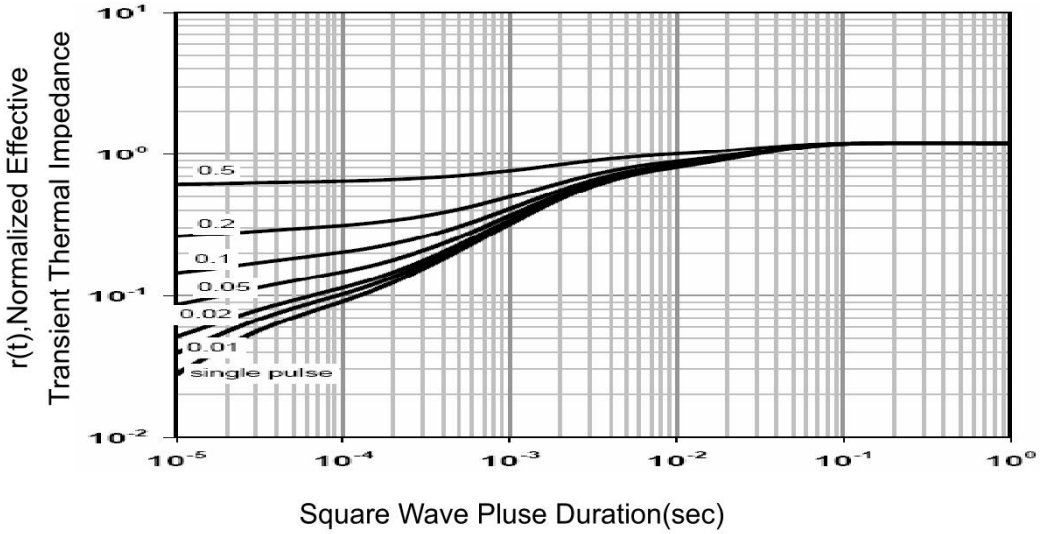
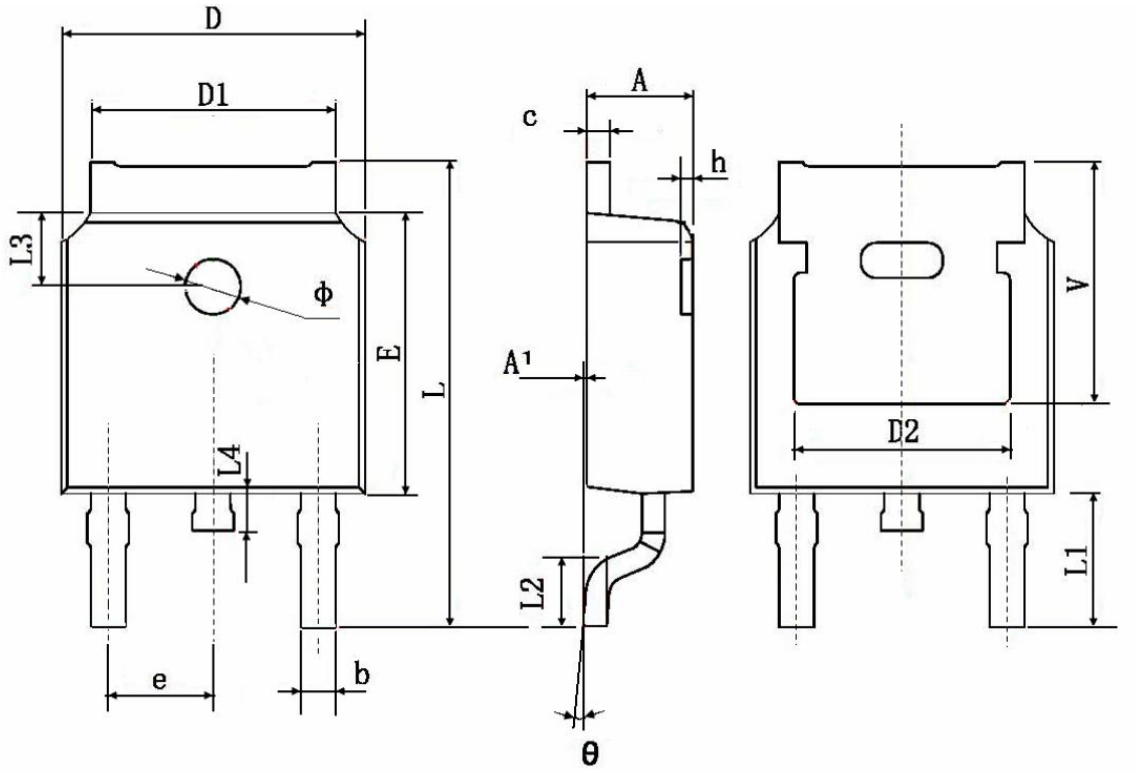


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	