AT080SN040MTA-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	7mΩ@10V	80A
	15mΩ@4.5V	

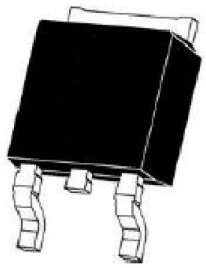
Feature

- 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
- Suffix “-Q1” for AEC-Q101

Application

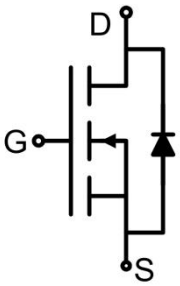
- PWM
- Load switching

Package



TO-252AB

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}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	80	A
Continuous Drain Current (T_C=100℃)	I_D(100℃)	56	A
Pulsed Drain Current	I_{DM}	350	A
Single Pulse Avalanche Energy[4]	E_{AS}	750	mJ
Power Dissipation	P_D	80	W
Thermal Resistance,Junction-to-Case[1]	$R_{\theta JC}$	1.88	℃/W
Operating Junction Temperature	T_J	-55 ~ +175	℃
Storage Temperature	T_{STG}	-55 ~ +175	℃

Electrical characteristics (T_C=25 °C, 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			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	1.2	1.8	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		5.2	7	mΩ
		V_{GS} =4.5V, I_D =20A		10	15	
Dynamic characteristics[3]						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz		2662		pF
Output Capacitance	C_{oss}			322		
Reverse Transfer Capacitance	C_{rss}			246		
Total Gate Charge	Q_g	V_{DS} =20V, V_{GS} =10V, I_D =20A		54.3		nC
Gate-Source Charge	Q_{gs}			6.9		
Gate-Drain Charge	Q_{gd}			14.5		
Turn-on delay time	$t_{d(on)}$	V_{DD} =20V, V_{GS} =10V, R_L =1Ω R_G =3Ω		12		nS
Turn-on rise time	t_r			11		
Turn-off delay time	$t_{d(off)}$			39		
Turn-off fall time	t_f			12		
Source-Drain Diode characteristics						
Diode Forward Current[1]	I_S				80	A
Diode Forward voltage[2]	V_{SD}	V_{GS} =0V, I_S =10A			1.2	V
Reverse Recovery Time	T_{rr}	I_F =20A, di/dt =100A/μs[2] T_J =25℃		45		nS
Reverse Recovery Charge	Q_{rr}			50		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 : T_J=25℃,V_{DD}=20V, V_G=10V, L=1mH, R_G=25Ω, I_{AS}=42A.

Typical Characteristics

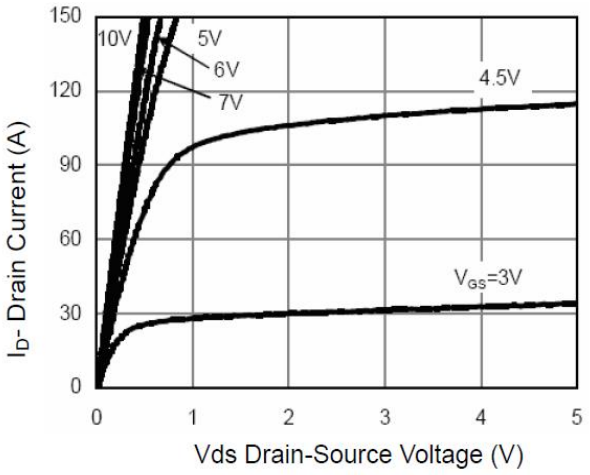


Figure 1 Output Characteristics

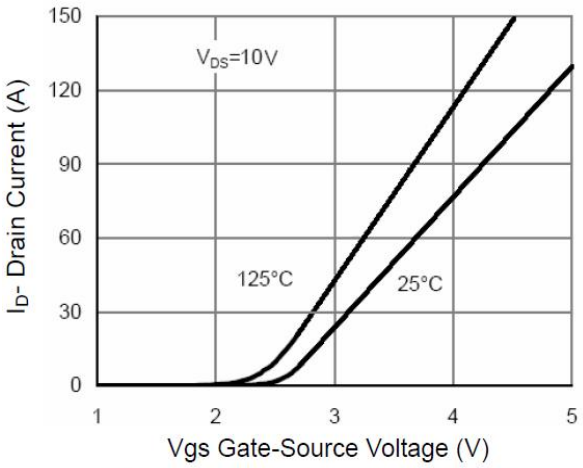


Figure 2 Transfer Characteristics

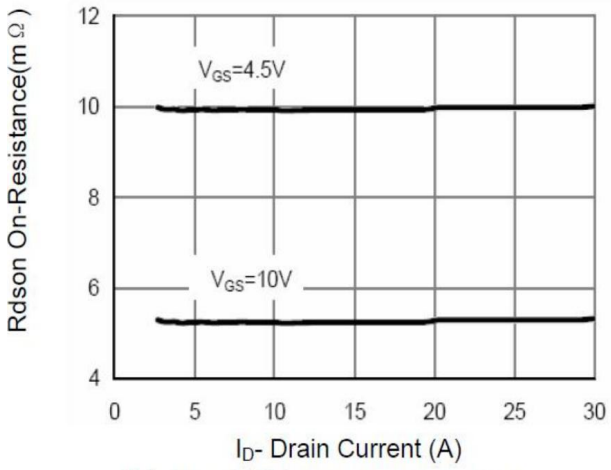


Figure 3 Rdson- Drain Current

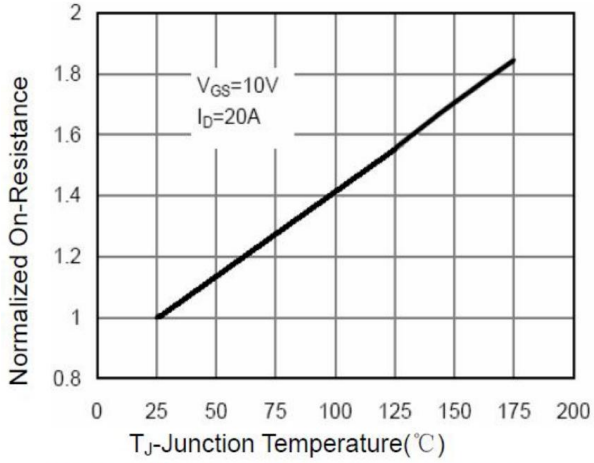


Figure 4 Rdson-JunctionTemperature

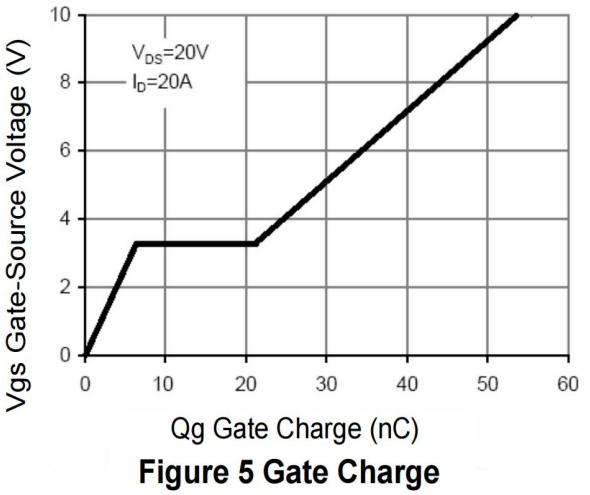


Figure 5 Gate Charge

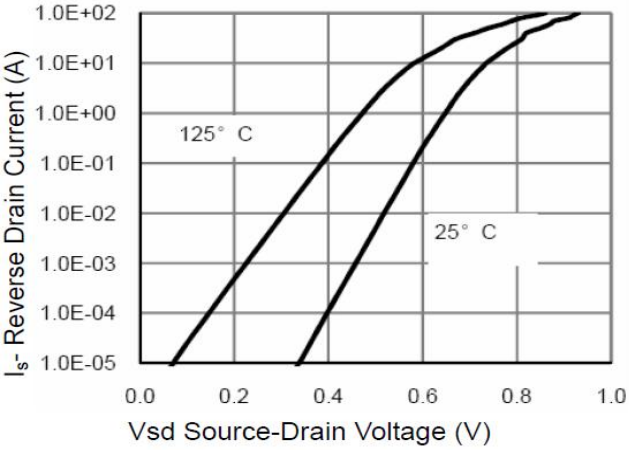


Figure 6 Source- Drain Diode Forward

Typical Characteristics

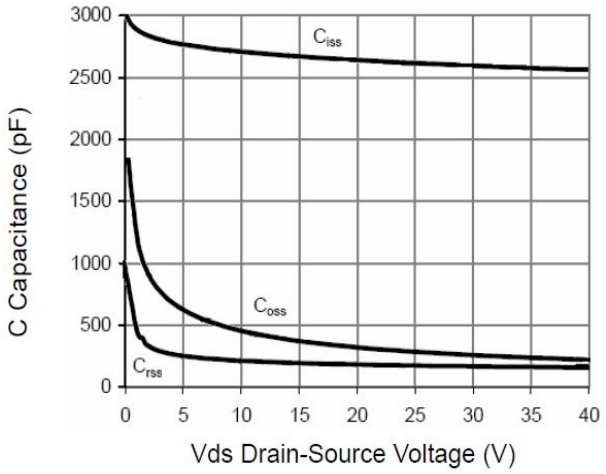


Figure 7 Capacitance vs Vds

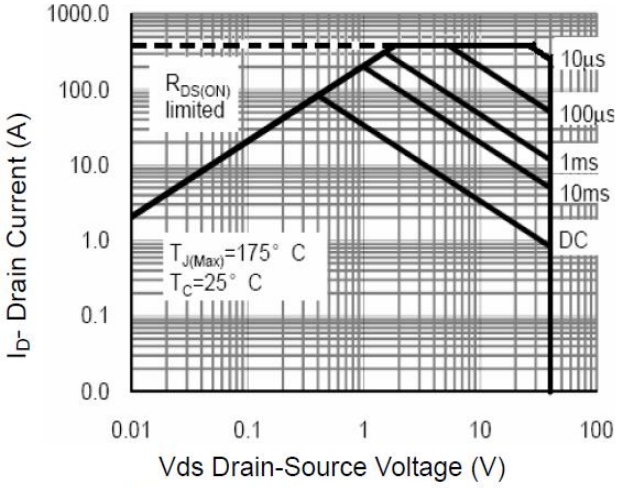


Figure 8 Safe Operation Area

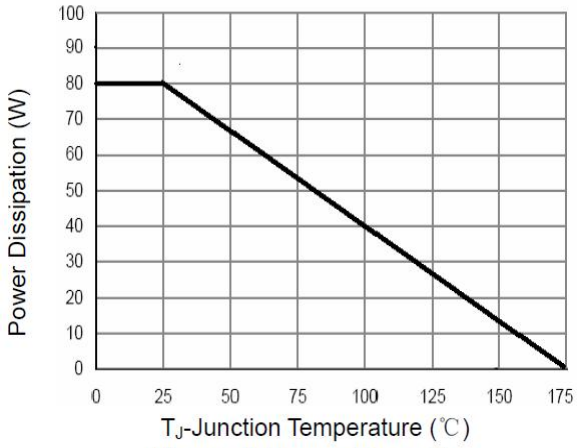


Figure 9 Power De-rating

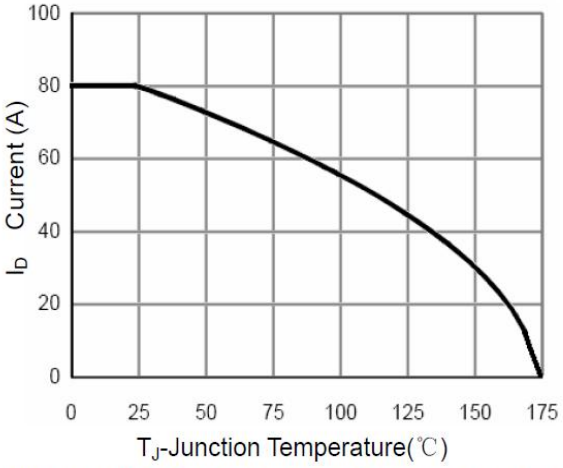
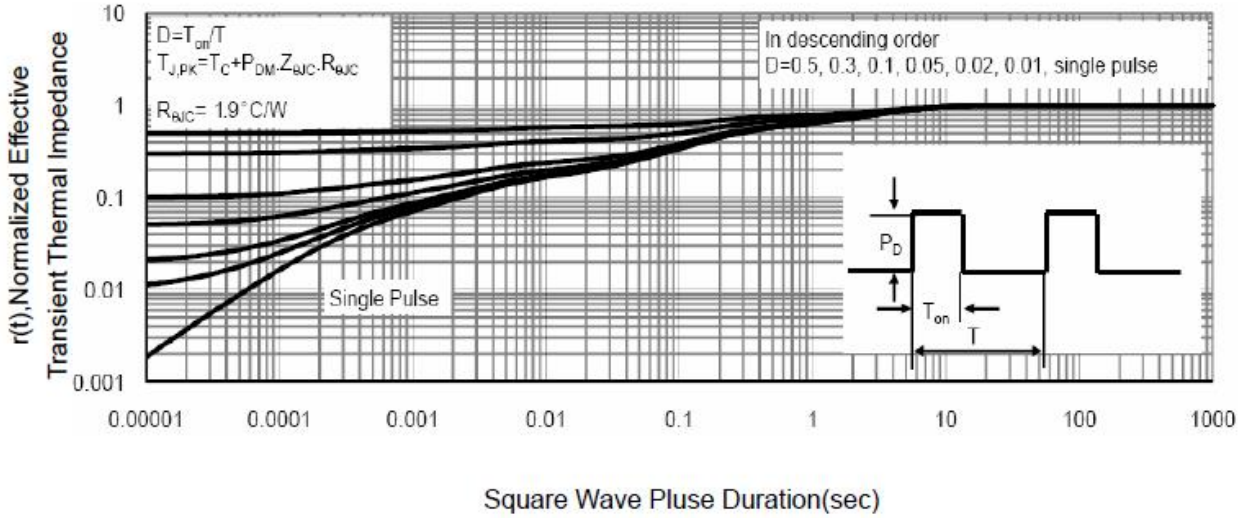
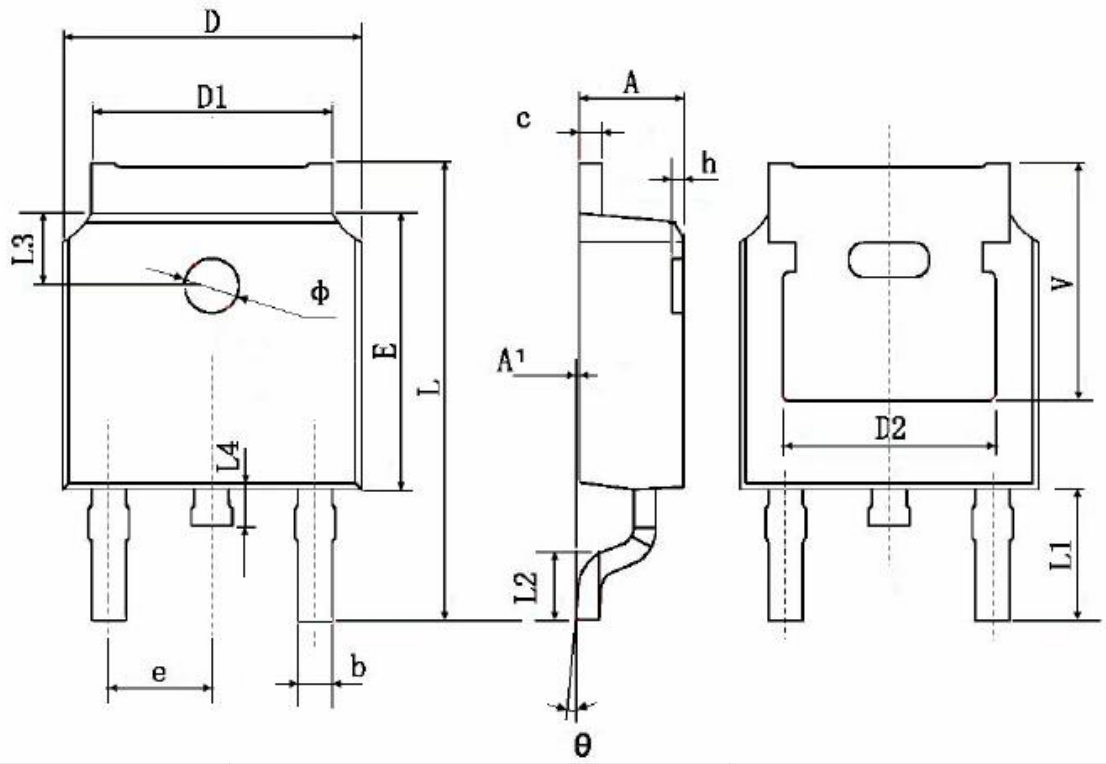


Figure 10ID Current- Junction Temperature



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 BSC.		0.190 BSC.	
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 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
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 REF.		0.211 REF.	