AT030SN040MPT-Q1

N-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	12mΩ@10V	30A
	17mΩ@4.5V	

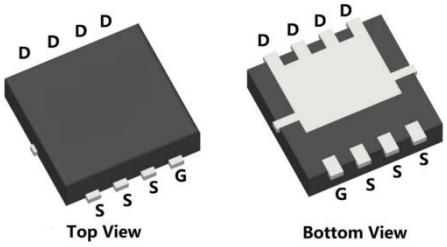
Feature

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Suffix “-Q1” for AEC-Q101

Application

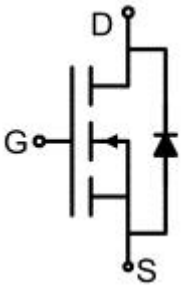
- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Package

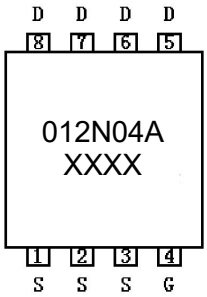


PDFN3.3*3.3-8L

Circuit diagram



Marking



Absolute maximum ratings (T_J=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[1,2] (T_C =25℃)	I_D	30	A
Continuous Drain Current[1,2] (T_C =100℃)	I_D (100℃)	19	A
Pulsed Drain Current (T_C =25℃,t_p=100μs)	I_{DM}	110	A
Power Dissipation[1,2] (T_C =25℃)	P_D	34	W
Single pulse avalanche energy[3]	E_{AS}	40.96	mJ
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	3.6	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=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			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	1.5	2	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =15A		9	12	mΩ
		V_{GS} =4.5V, I_D =10A		12.5	17	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =20V,V_{GS} =0V,f =1MHz		980		pF
Output Capacitance	C_{oss}			95		
Reverse Transfer Capacitance	C_{rss}			82		
Total Gate Charge	Q_g	V_{DS} =20V,V_{GS} =10V, I_D =15A		21.4		nC
Gate-Source Charge	Q_{gs}			3.1		
Gate-Drain Charge	Q_{gd}			5.3		
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V,V_{GS}=10V, I_D=15A,R_{GEN}=2.7Ω		8.5		nS
Turn-on rise time	t_r			51		
Turn-off delay time	$t_{d(off)}$			26.2		
Turn-off fall time	t_f			6.5		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				30	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S=10A			1.2	V
Reverse Recovery Time	t_{rr}	I_F =15A, di/dt =100A/μs		12		nS
Reverse Recovery Charge	Q_{rr}			6.3		nC

Notes:

1) The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

2) Thermal resistance from junction to soldering point (on the exposed drain pad).

3) V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=12.8A.

4) Guaranteed by design, not subject to production.

Typical Characteristics

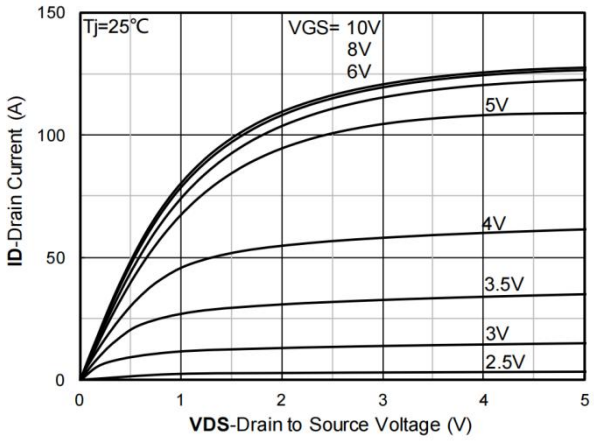


Figure 1. Output Characteristics

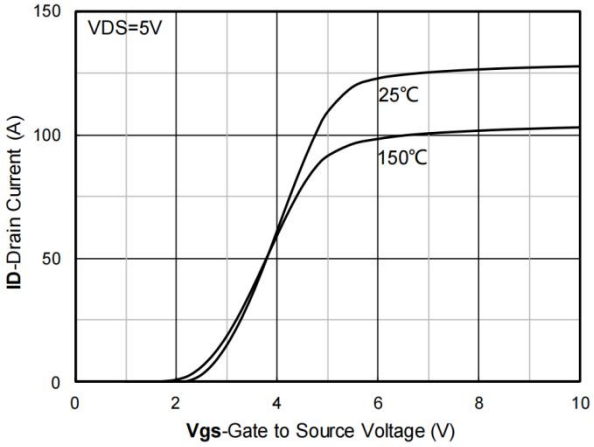


Figure 2. Transfer Characteristics

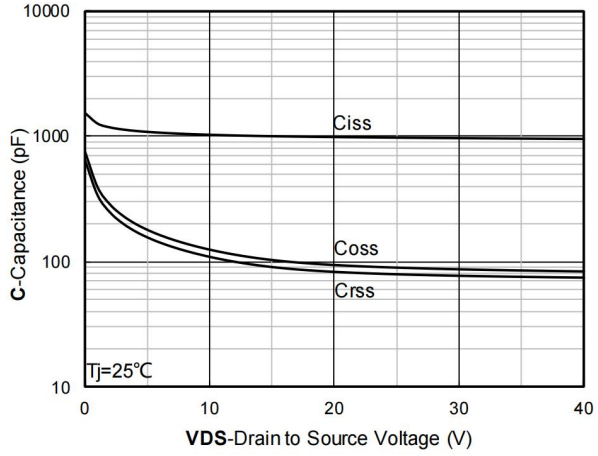


Figure 3. Capacitance Characteristics

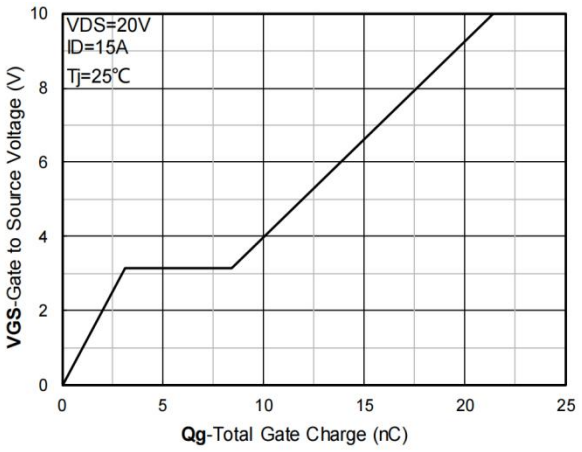


Figure 4. Gate Charge

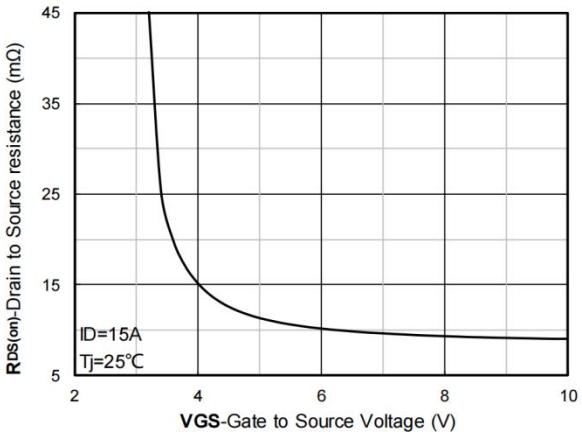


Figure 5. On-Resistance vs Gate to Source Voltage

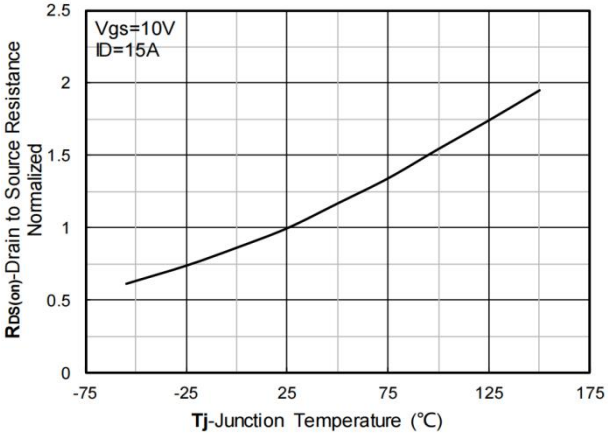


Figure 6. Normalized On-Resistance

Typical Characteristics

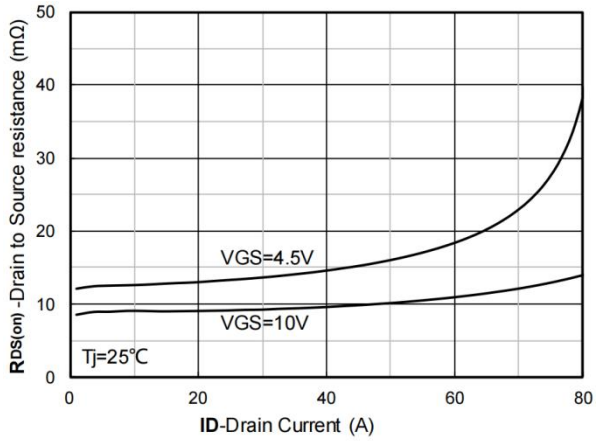


Figure 7. RDS(on) VS Drain Current

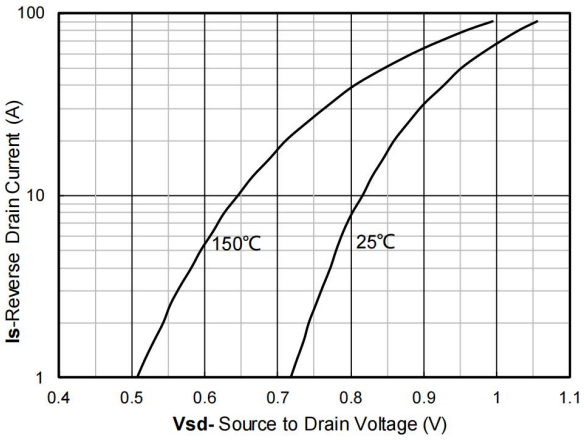


Figure 8. Forward characteristics of reverse diode

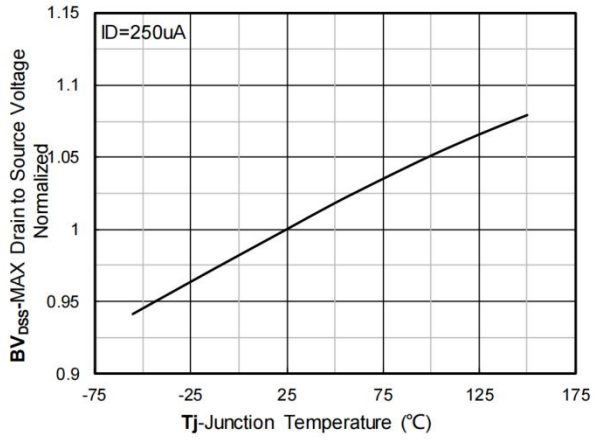


Figure 9. Normalized breakdown voltage

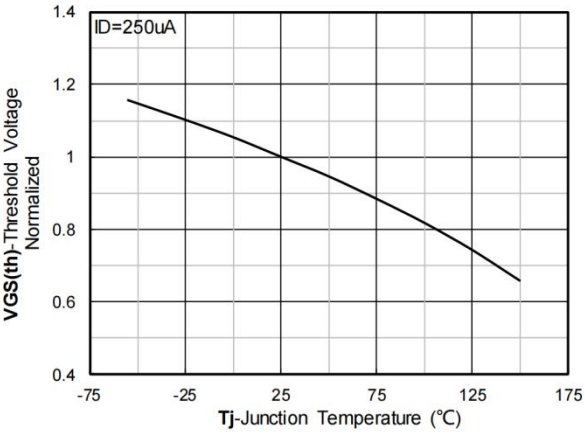


Figure 10. Normalized Threshold voltage

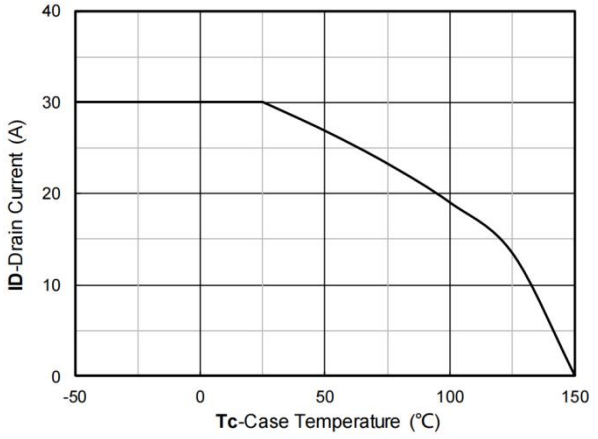


Figure 11. Current dissipation

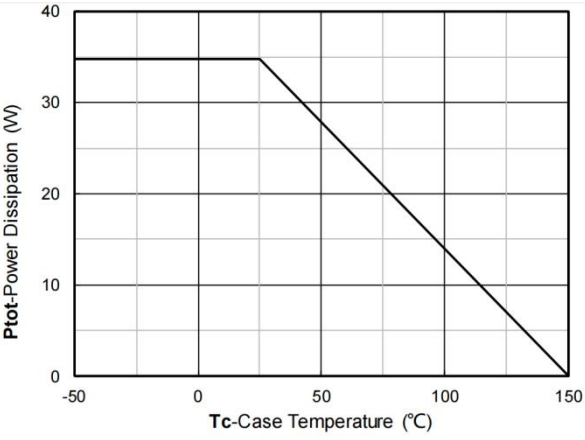


Figure 12. Power dissipation

Typical Characteristics

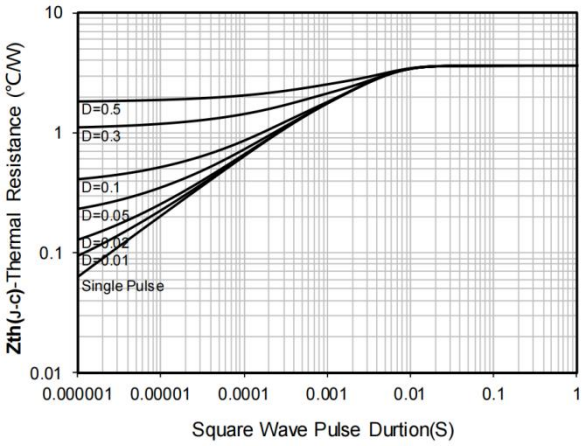


Figure 13. Maximum Transient Thermal Impedance

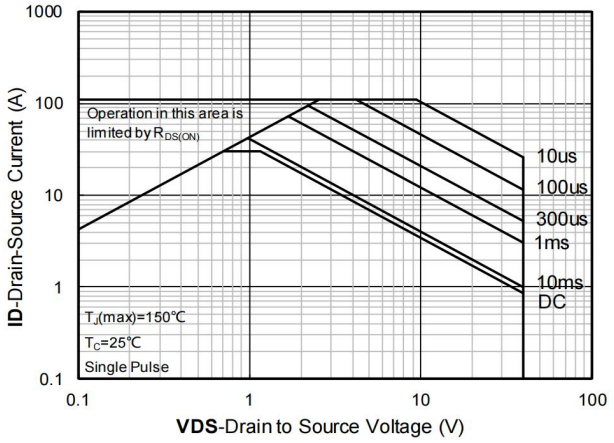
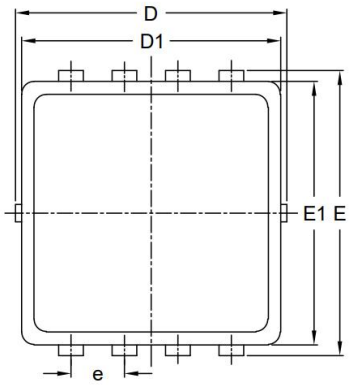
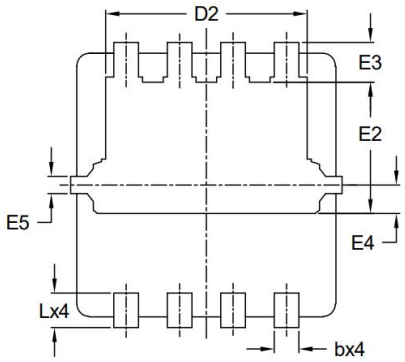


Figure 14. Safe Operation Area

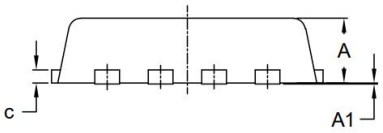
PDFN3.3*3.3-8L Package Information



TOP VIEW



BOTTOM VIEW



SIDE VIEW

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.850	0.028	0.033
A1	0.000	0.050	0.000	0.002
b	0.200	0.400	0.008	0.016
c	0.100	0.250	0.004	0.010
D	3.150	3.450	0.124	0.136
D1	3.000	3.300	0.118	0.130
D2	2.250	2.650	0.089	0.104
E	3.150	3.450	0.124	0.136
E1	2.900	3.200	0.114	0.126
E2	1.320	1.720	0.052	0.068
E3	0.280	0.650	0.011	0.026
E4	0.330 REF		0.013 REF	
E5	0.200 REF		0.008 REF	
e	0.650 BSC		0.026 BSC	
L	0.300	0.500	0.012	0.020