AT100SN040MQPF-Q1

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	3.5mΩ@10V	100A
	4.8mΩ@4.5V	

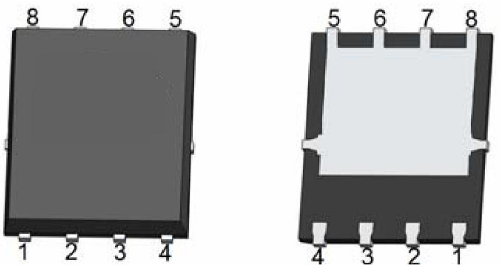
Feature

- Trench power LV MOSFET technology
- High density cell design for low $R_{DS(ON)}$
- Excellent package for heat dissipation
- Suffix “-Q1” for AEC-Q101

Application

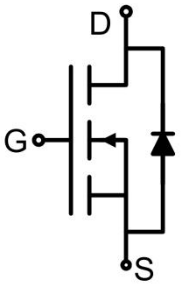
- DC-DC converters
- Power management functions
- Backlighting

Package

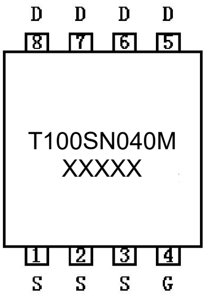


PDFN5*6-8L

Circuit diagram



Marking



Absolute maximum ratings (T_A=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 (T_C =25℃)	I_D	100	A
Continuous Drain Current (T_C =100℃)	I_D(100℃)	63	A
Pulsed Drain Current$^{1)}$	I_{DM}	360	A
Single Pulse Avalanche Energy$^{2)}$	E_{AS}	400	mJ
Power Dissipation$^{3)}$ (T_C =25℃)	P_D	83	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.67	℃/W
Operating Junction Temperature	T_J	-55 ~ +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_{DS} =0V, V_{GS} =±20V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	1	1.5	2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		2.8	3.5	mΩ
		V_{GS} =4.5V, I_D =20A		4	4.8	
Dynamic characteristics$^{4)}$						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz		4645		pF
Output Capacitance	C_{oss}			436		
Reverse Transfer Capacitance	C_{rss}			360		
Total Gate Charge	Q_g	V_{DS} =20V, V_{GS} =10V, I_D =20A		102		nC
Gate-Source Charge	Q_{gs}			15.8		
Gate-Drain Charge	Q_{gd}			21.9		
Turn-on delay time	$t_{d(on)}$	V_{DS} =20V, V_{GS} =10V, I_D =20A R_G =3Ω		12		nS
Turn-on rise time	t_r			54		
Turn-off delay time	$t_{d(off)}$			120		
Turn-off fall time	t_f			80		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				100	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =20A			1.2	V
Reverse Recovery Time	T_{rr}	I_F =20A, di/dt =-100A/μs		22.3		nS
Reverse Recovery Charge	Q_{rr}			7.4		nC

Notes:

1) Pulse Test: Pulse Width ≤300us,Duty cycle ≤2%.

2) T_J =25℃, V_{DD} =40V, V_G =10V, L =2mH.

3) The power dissipation P_D is based on $T_{J(MAX)}$=150℃, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heat sinking is used.

4) Guaranteed by design, not subject to production.

Typical Characteristics

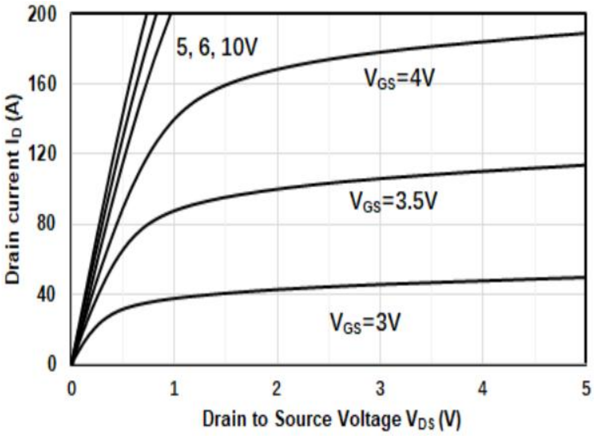


Figure1. Output Characteristics

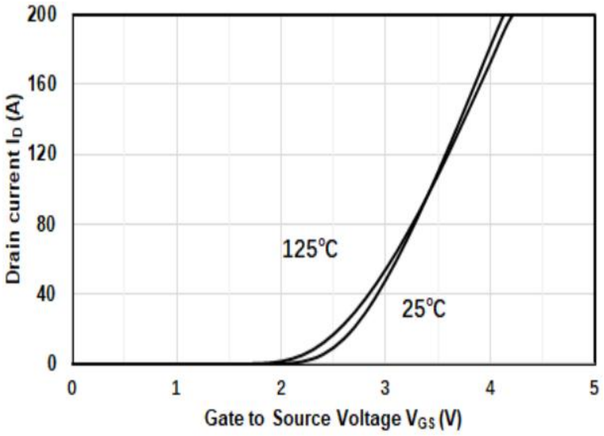


Figure2. Transfer Characteristics

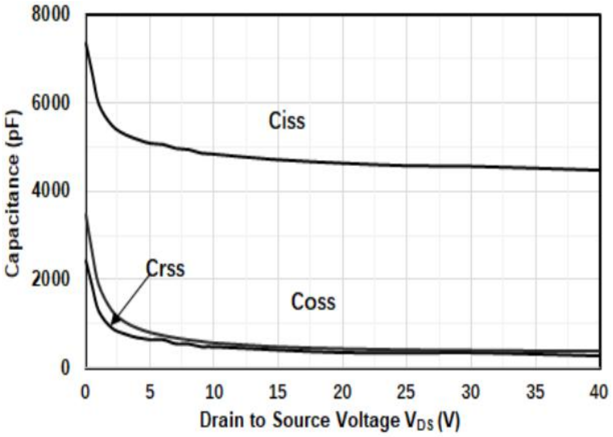


Figure3. Capacitance Characteristics

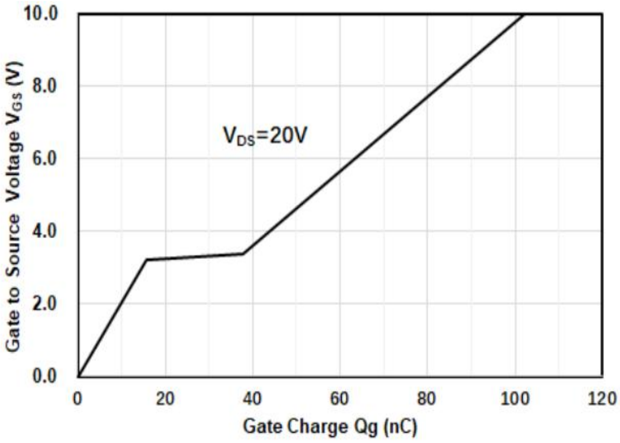


Figure4. Gate Charge

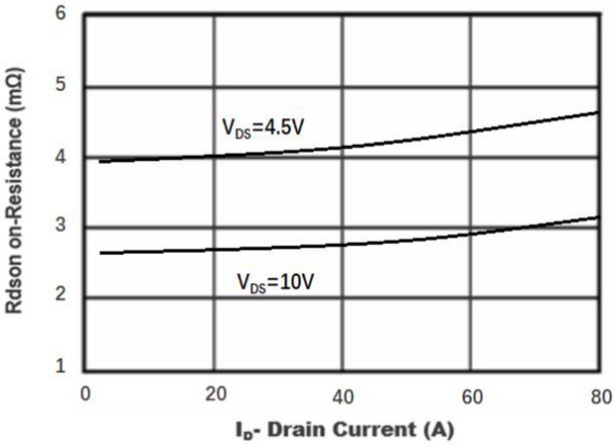


Figure5. Drain-Source on Resistance

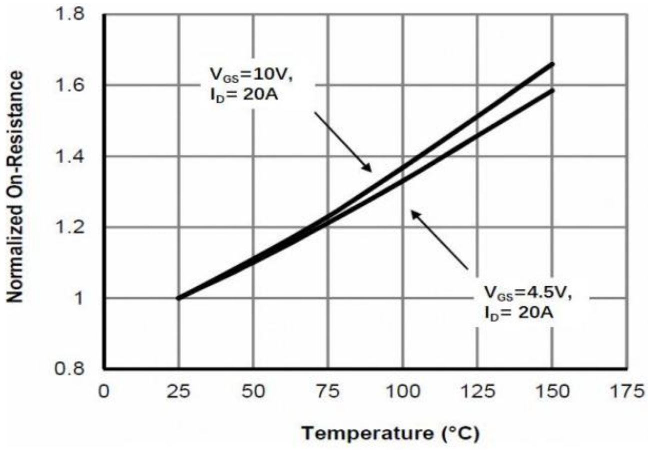


Figure6. Drain-Source on Resistance

Typical Characteristics

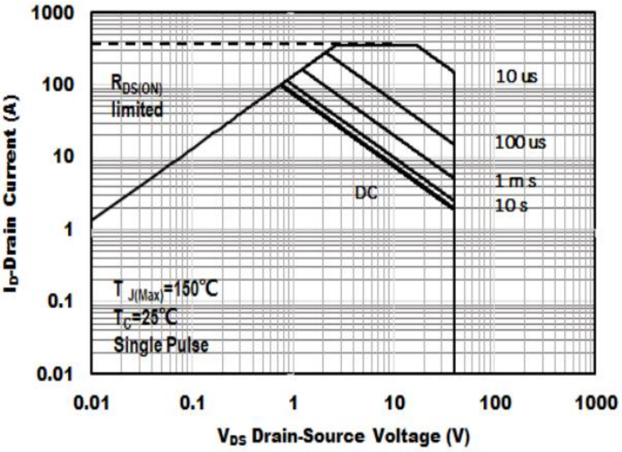


Figure7. Safe Operation Area

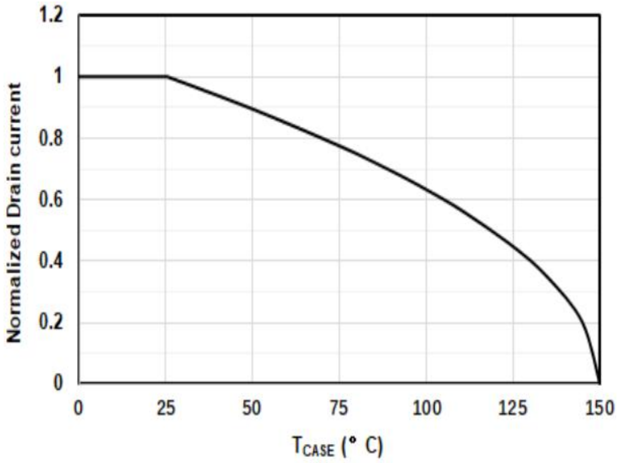


Figure8. Drain current vs. Case Temperature

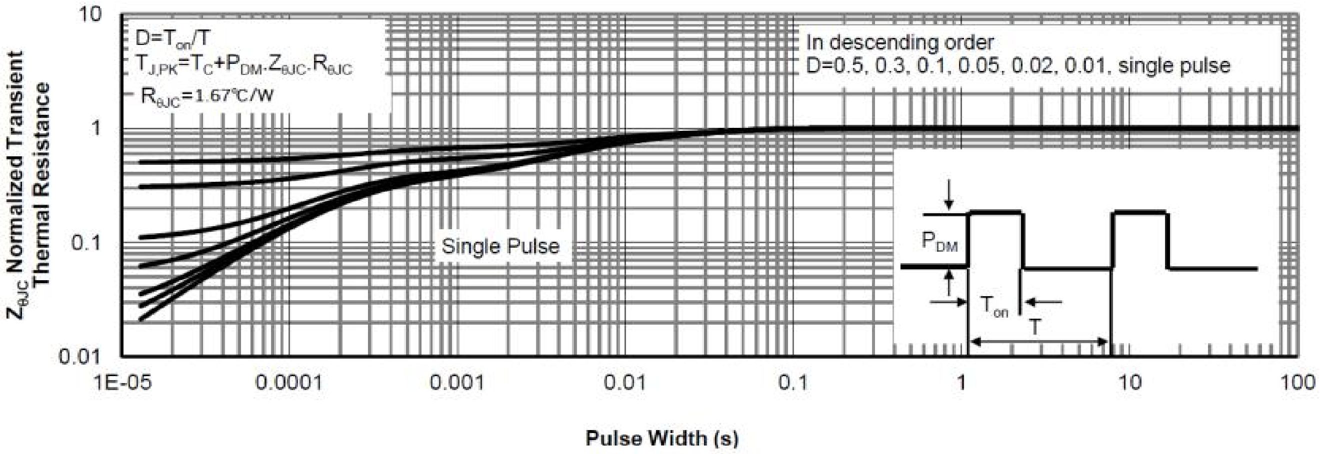
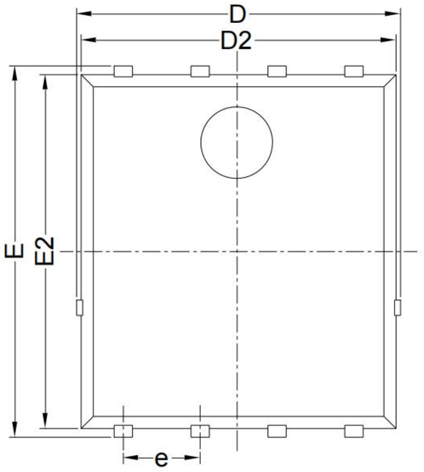
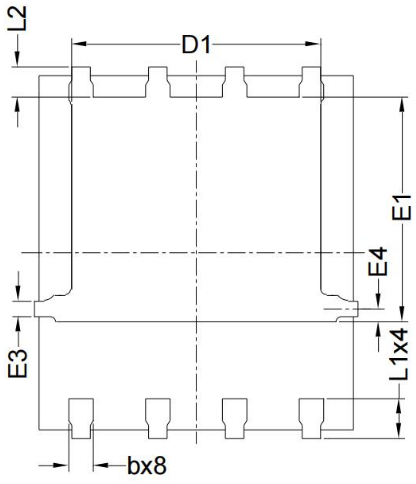


Figure9. Normalized Maximum Transient Thermal Impedance

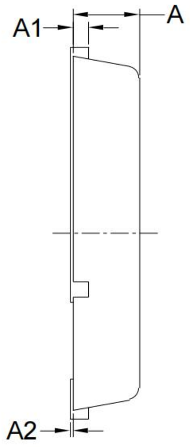
PDFN5*6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	5.150	5.550	0.203	0.219
E	5.950	6.350	0.234	0.250
A	1.000	1.200	0.039	0.047
A1	0.254 BSC.		0.010 BSC.	
A2	0.000	0.100	0.000	0.004
D1	3.920	4.320	0.154	0.170
E1	3.520	3.920	0.139	0.154
D2	5.000	5.400	0.197	0.213
E2	5.660	6.060	0.223	0.239
E3	0.254 REF.		0.010 REF.	
E4	0.210 REF.		0.008 REF.	
L1	0.560	0.760	0.022	0.030
L2	0.500 BSC.		0.020 BSC.	
b	0.310	0.510	0.012	0.020
e	1.270 BSC.		0.050 BSC.	