AT016SP100MNK

P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-100V	85mΩ@-10V	-16A
	102mΩ@-4.5V	

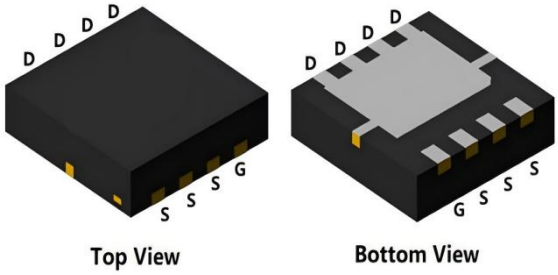
Feature

- Trench Power MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(on)}$
- Suffix"-Q1"for AEC-Q101

Application

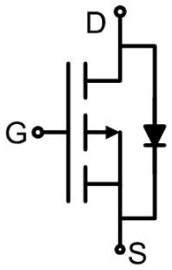
- Load switch
- Motor drive control
- DC-DC convertor

Package

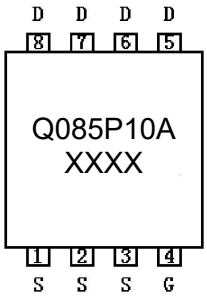


DFN3.3*3.3-8L

Circuit diagram



Marking



AT016SP100MNK

P-Channel Enhancement Mode MOSFET

Absolute maximum ratings (T_J=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[1,3] (V_{GS} =-10V, T_C =25℃)	I_D	-16	A
Continuous Drain Current[1,3] (V_{GS} =-10V, T_C =100℃)	I_D (100℃)	-10	A
Pulsed Drain Current (T_C =25℃, t_p =100μs)	I_{DM}	-60	A
Single Pulse Avalanche Energy[2]	E_{AS}	79.38	mJ
Power Dissipation[1,3] (T_C =25℃)	P_D	56	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.2	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_J=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	-100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-100V, 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	-1.5	-2	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-10A		66	85	mΩ
		V_{GS} =-4.5V, I_D =-10A		74	102	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =-50V, V_{GS} =0V, f =1MHz		2040		pF
Output Capacitance	C_{oss}			90		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge	Q_g	V_{DS} =-50V, V_{GS} =-10V I_D =-10A		44.4		nC
Gate-Source Charge	Q_{gs}			4.7		
Gate-Drain Charge	Q_{gd}			5.5		
Turn-on delay time	$t_{d(on)}$	V_{DS} =-50V, V_{GS} =-10V I_D =-10A, R_G =3Ω		9		nS
Turn-on rise time	t_r			42		
Turn-off delay time	$t_{d(off)}$			91		
Turn-off fall time	t_f			31		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-16	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =-10A			-1.2	V
Reverse Recovery Time	T_{rr}	I_F =-10A, di/dt =-100A/μs		30		nS
Reverse Recovery Charge	Q_{rr}			45		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) T_J =25℃, V_G=-10V, L =1mH, I_{AS} =-12.6A, R_G =25Ω.

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

4) Guaranteed by design, not subject to production testing.

Typical Characteristics

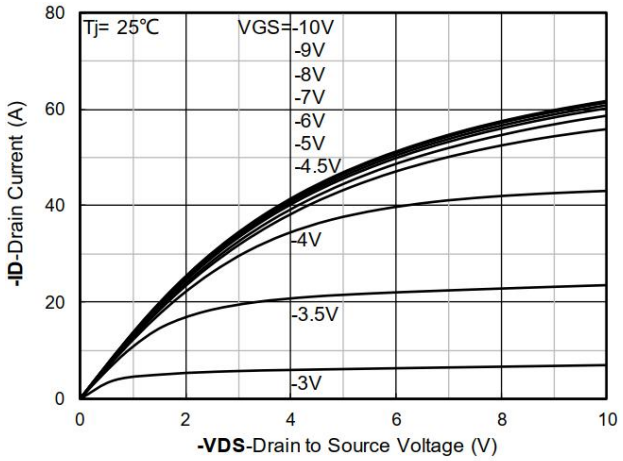


Figure 1. Output Characteristics

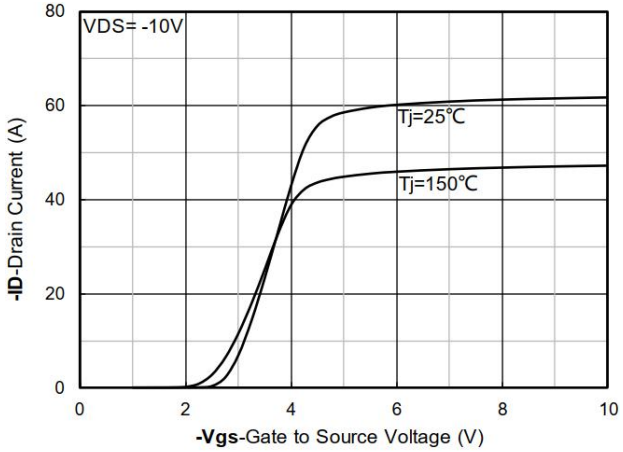


Figure 2. Transfer Characteristics

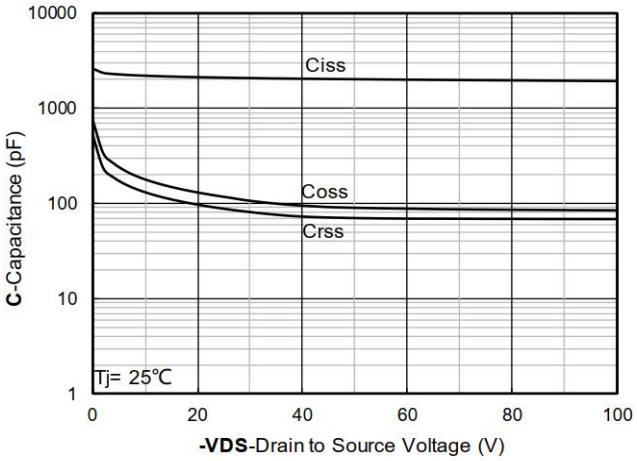


Figure 3. Capacitance Characteristics

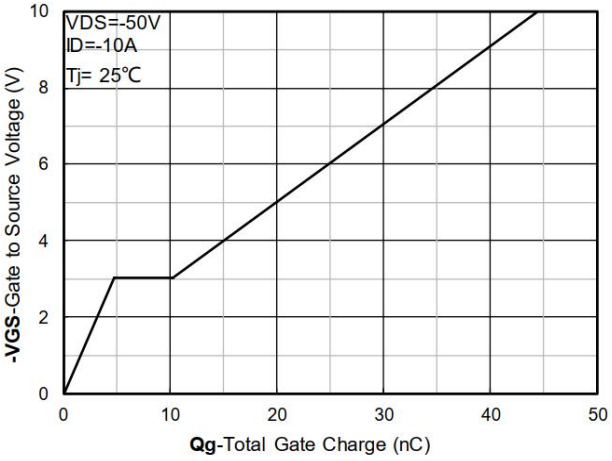


Figure 4. Gate Charge

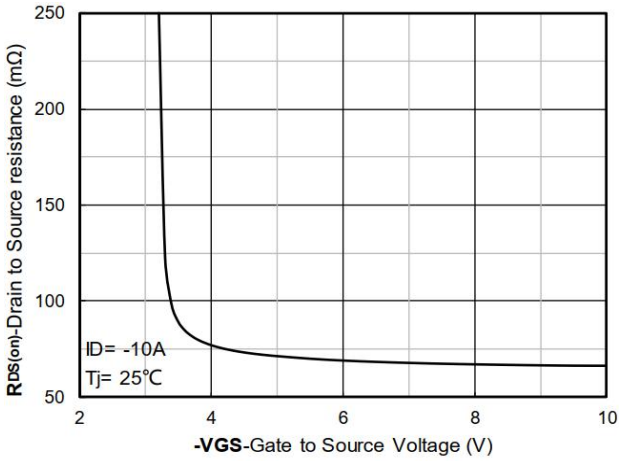


Figure 5. On-Resistance vs Gate to Source Voltage

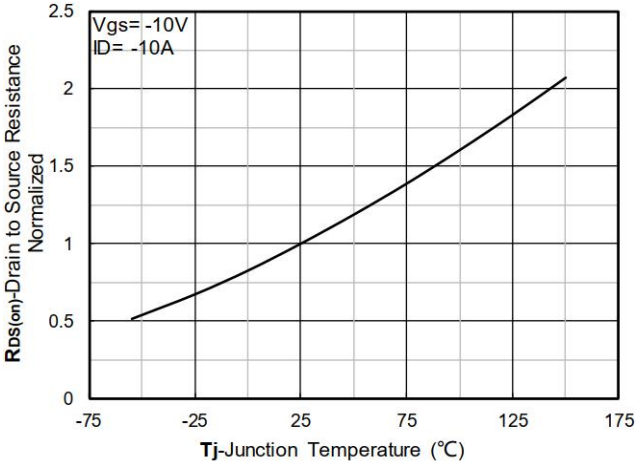


Figure 6. Normalized On-Resistance

Typical Characteristics

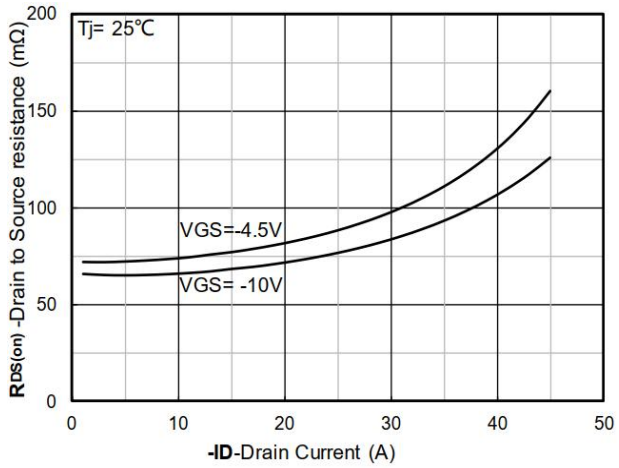


Figure 7. $R_{DS(on)}$ VS Drain Current

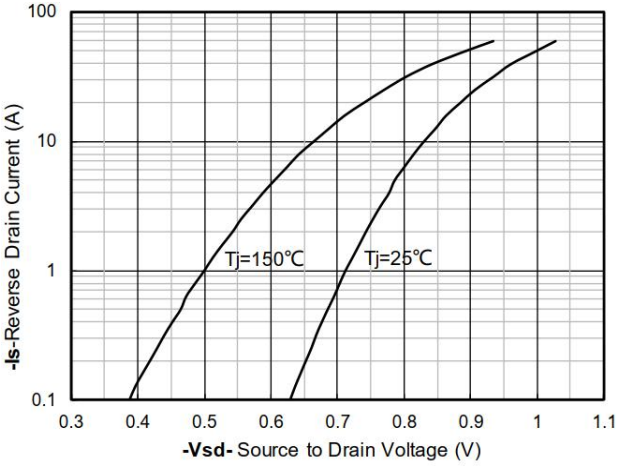


Figure 8. Forward characteristics of reverse diode

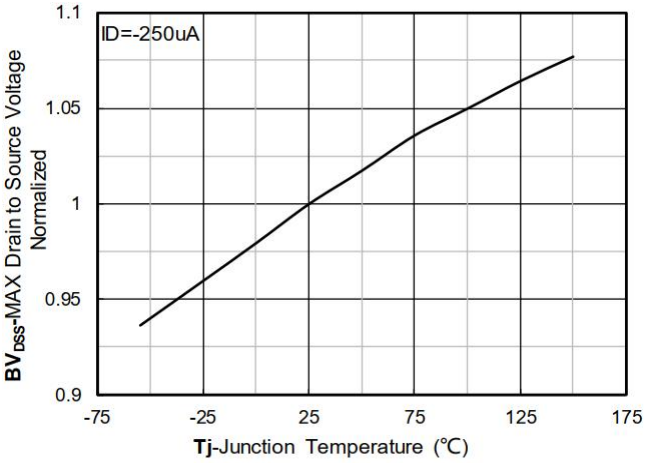


Figure 9. Normalized breakdown voltage

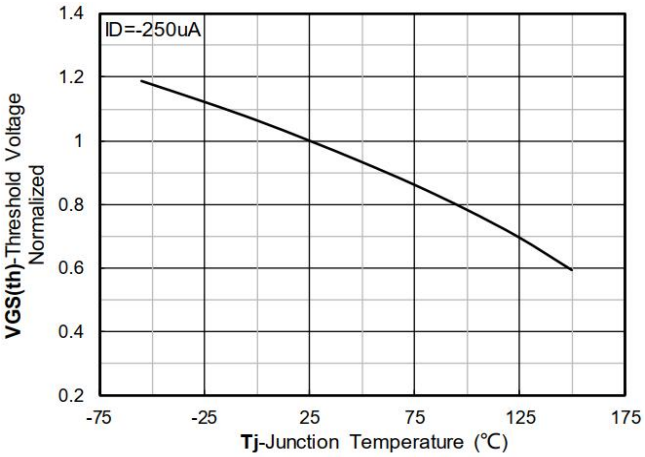


Figure 10. Normalized Threshold voltage

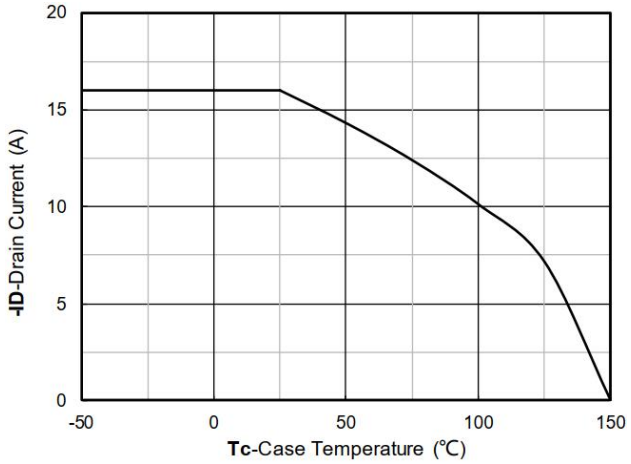


Figure 11. Current dissipation

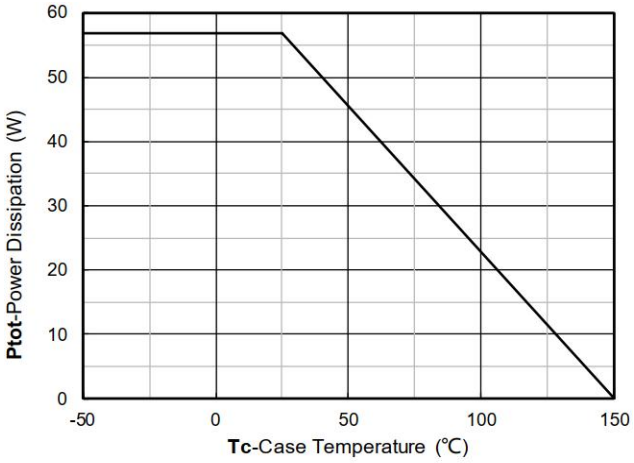


Figure 12. Power dissipation

Typical Characteristics

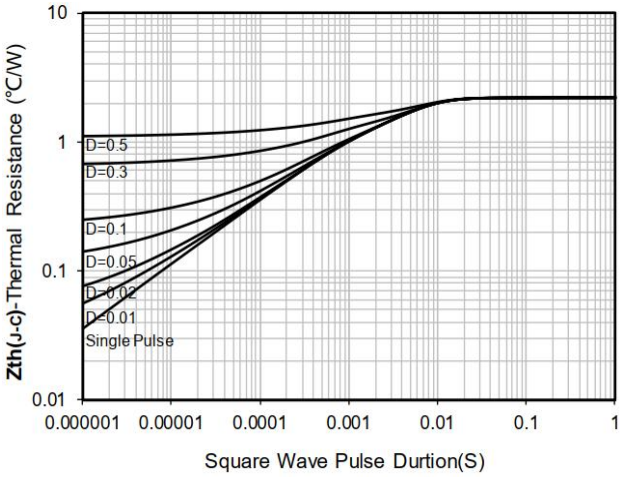


Figure 13. Maximum Transient Thermal Impedance

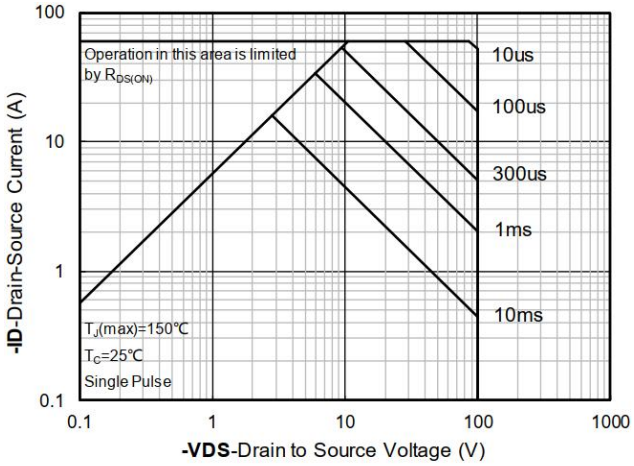
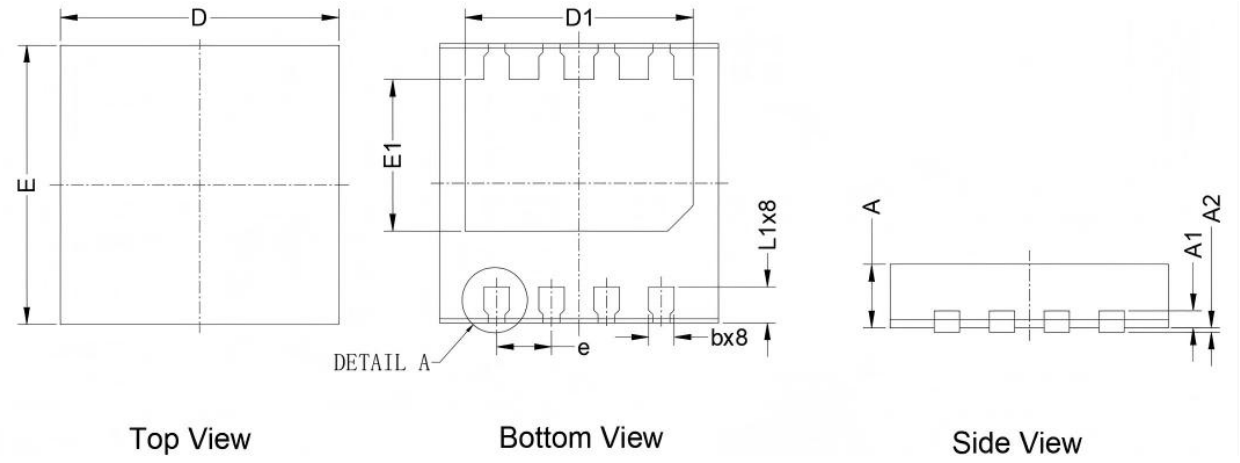


Figure 14. Safe Operation Area

DFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
D	3.300 BSC.		0.130 BSC.	
E	3.300 BSC.		0.130 BSC.	
A	0.700	0.800	0.028	0.031
A1	0.203 BSC.		0.008 BSC.	
A2	0.000	0.100	0.000	0.004
D1	2.600	2.800	0.102	0.110
E1	1.690	1.890	0.067	0.074
L1	0.325	0.525	0.013	0.021
b	0.200	0.400	0.008	0.016
e	0.650 BSC.		0.026 BSC.	