AT050SN060MPT

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
60V	16mΩ@10V	50A
	20mΩ@4.5V	

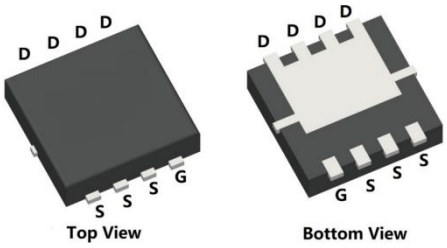
Feature

- Advanced trench technology
- Excellent $R_{DS(ON)}$
- Low gate charge

Application

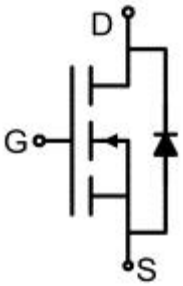
- Brushless motor
- Load switch
- Uninterruptible power supply

Package

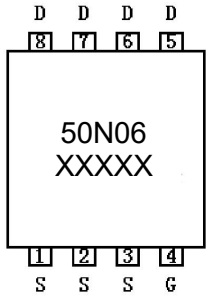


PDFN3.3*3.3-8L

Circuit diagram



Marking



Absolute maximum ratings (T_C=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1] (V_{GS}=10V)	I_D	50	A
Continuous Drain Current[1] (V_{GS}=10V,T_C=100℃)	I_D (100 ℃)	30	A
Pulsed Drain Current[2]	I_{DM}	90	A
Power Dissipation[4]	P_D	45	W
Single Pulse avalanche Energy[3]	E_{AS}	39.2	mJ
Thermal Resistance,Junction-to-Case[1]	$R_{\theta JC}$	2.8	℃/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	60			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =48V,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[2]	$R_{DS(on)}$	V_{GS} =10V, I_D =20A		11	16	mΩ
		V_{GS} =4.5V, I_D =10A		16	20	
Dynamic characteristics[6]						
Input Capacitance	C_{iss}	V_{DS} =15V, V_{GS} =0V, f =1MHz		2423		pF
Output Capacitance	C_{oss}			145		
Reverse Transfer Capacitance	C_{rss}			97		
Total Gate Charge	Q_g	V_{DS} =48V, V_{GS} =4.5V I_D =15A		19.3		nC
Gate-Source Charge	Q_{gs}			7.1		
Gate-Drain Charge	Q_{gd}			7.6		
Turn-on delay time	$t_{d(on)}$	V_{DS} =30V, V_{GS} =10V R_G =3.3Ω, I_D =15A		7.2		nS
Turn-on rise time	t_r			50		
Turn-off delay time	$t_{d(off)}$			36.4		
Turn-off fall time	t_f			7.6		
Source-Drain Diode characteristics						
Diode Forward Current[1,5]	I_S	V_D =V_G =0V, Force Current			35	A
Diode Forward voltage[2]	V_{SD}	V_{GS} =0V, I_S =1A			1.0	V
Reverse Recovery Time	T_{rr}	I_F =15A, di/dt =100A/μs		16.3		nS
Reverse Recovery Charge	Q_{rr}			11		nC

Notes:

1) The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2) The data tested by pulsed , pulse width ≦300us, duty cycle ≦2%.

3) The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=38A.

4) The power dissipation is limited by 150℃ junction temperature.

5) The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

6) Guaranteed by design, not subject to production.

Typical Characteristics

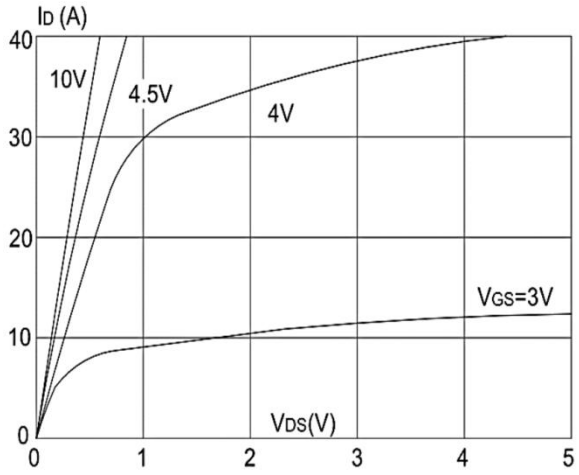


Figure1: Output Characteristics

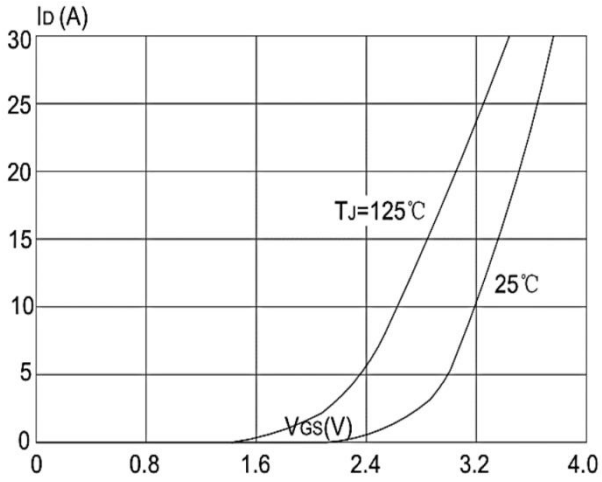


Figure 2: Typical Transfer Characteristics

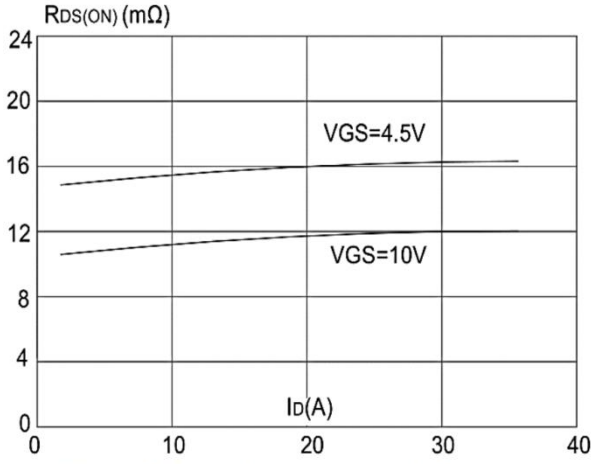


Figure 3:On-resistance vs. Drain Current

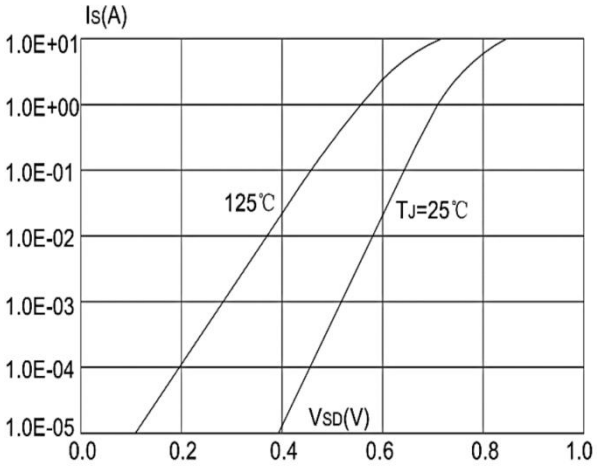


Figure 4: Body Diode Characteristics

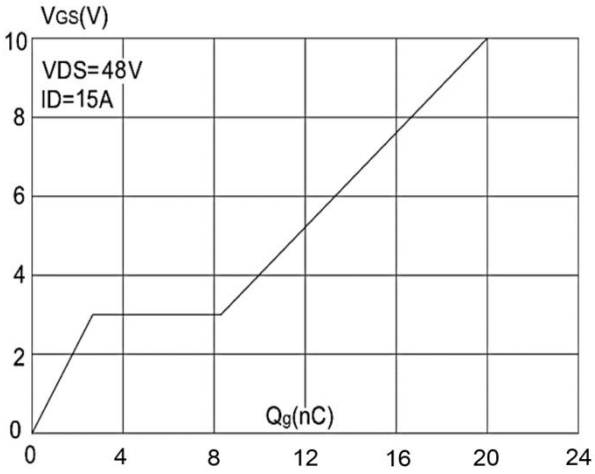


Figure 5: Gate Charge Characteristics

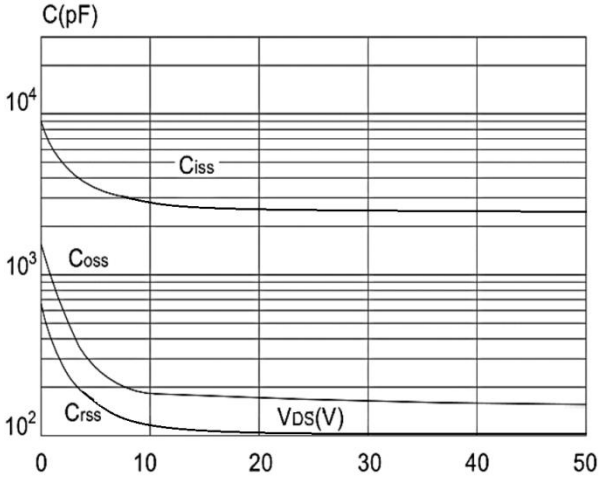


Figure 6: Capacitance Characteristics

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Typical Characteristics

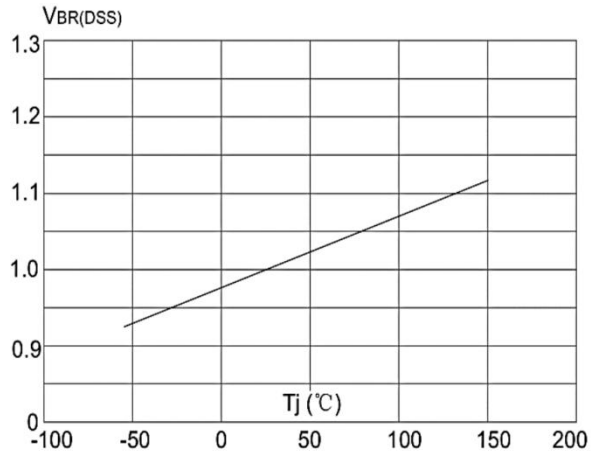


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

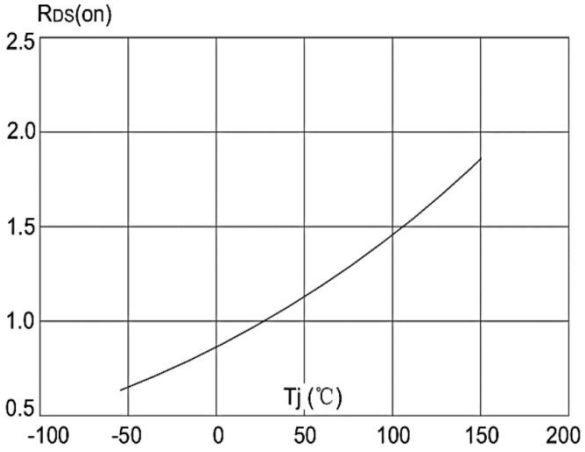


Figure 8: Normalized on Resistance vs. Junction Temperature

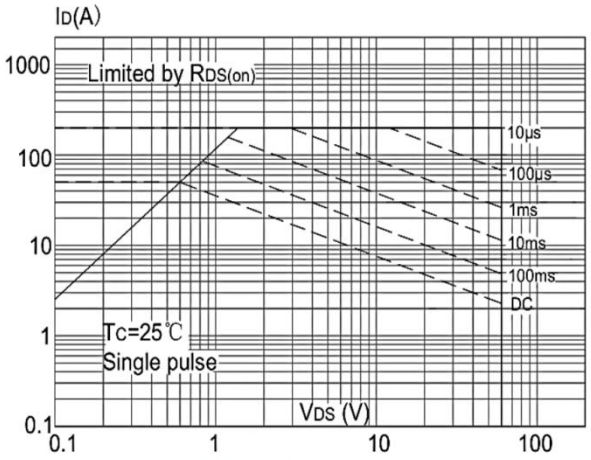


Figure 9: Maximum Safe Operating Area

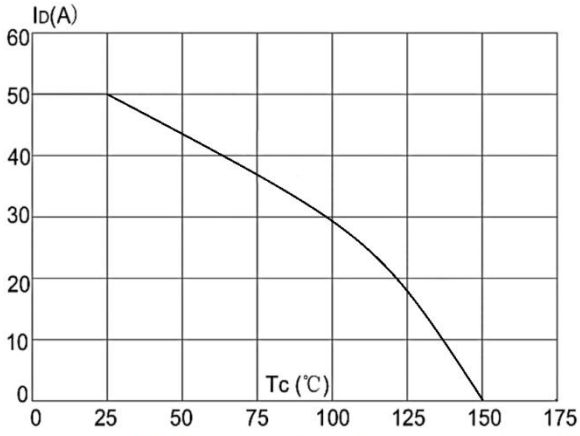


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

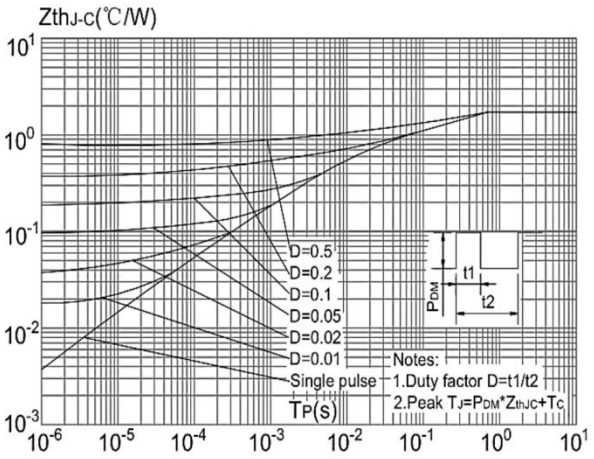
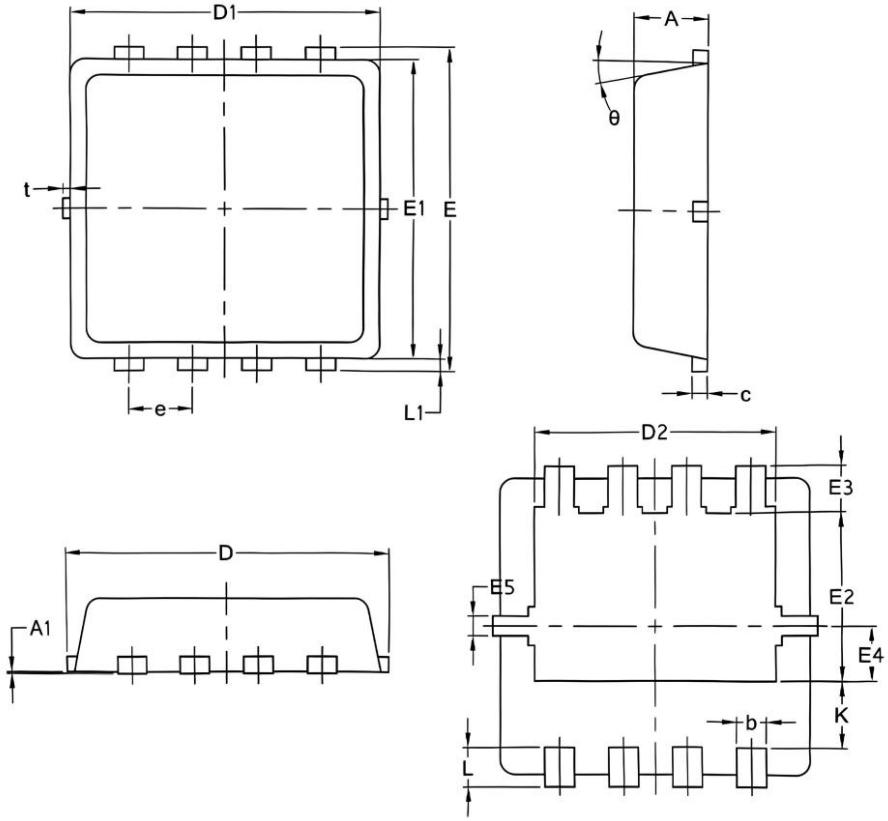


Figure.11: Maximum Effective Transient Thermal

PDFN3.3*3.3-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.850	0.028	0.033
A1	-	0.050	-	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	3.250	0.118	0.128
D2	2.290	2.650	0.090	0.104
E	3.150	3.450	0.124	0.136
E1	2.900	3.200	0.114	0.126
E2	1.540	1.940	0.061	0.076
E3	0.280	0.650	0.011	0.026
E4	0.370	0.770	0.015	0.030
E5	0.100	0.300	0.004	0.012
e	0.600	0.700	0.024	0.028
K	0.590	0.890	0.023	0.035
L	0.300	0.500	0.012	0.020
L1	0.060	0.200	0.002	0.008
t	0.000	0.130	0.000	0.005
ϕ	10.000	14.000	0.394	0.551