AT050SN040MPF

N-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
40V	12mΩ@10V	50A
	18mΩ@4.5V	

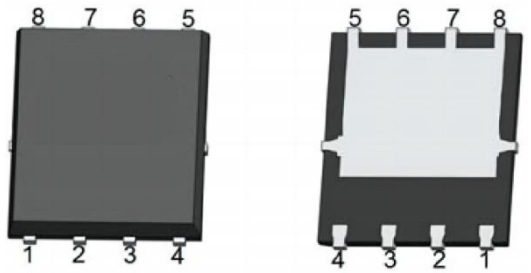
Feature

- Fast switching speed
- Surface mount package

Application

- DC-DC converters.
- Motor control

Package



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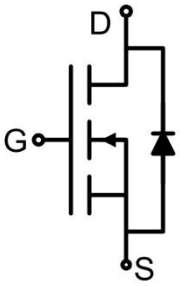
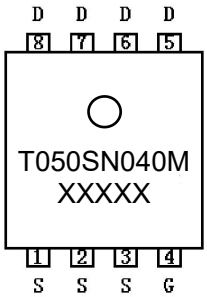
Circuit diagram



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	50	A
Continuous Drain Current (T_C =100℃)	I_D(100℃)	33	A
Pulsed Drain Current	I_{DM}	200	A
Single Pulse Avalanche Energy[1)]	E_{AS}	51	mJ
Power Dissipation (T_C =25℃)	P_D	35	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	3.6	℃/W
Operating Junction Temperature	T_J	-55 ~ +150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25℃, unless otherwise noted)

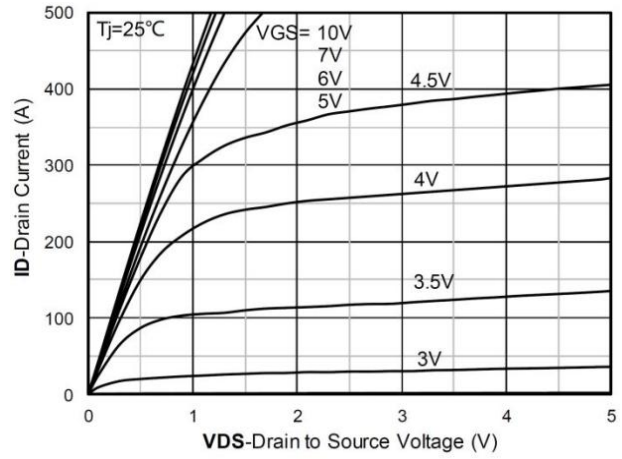
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} =0V, I_D =250μA	40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =32V, V_{GS} =0V, T_J =25℃			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} =0V, V_{GS} =±20V			±100	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 =12A		8	12	mΩ
		V_{GS} =4.5V, I_D =6A		11	18	
Dynamic characteristics[2)]						
Input Capacitance	C_{iss}	V_{DS} =20V, V_{GS} =0V, f =1MHz		1785		pF
Output Capacitance	C_{oss}			210		
Reverse Transfer Capacitance	C_{rss}			158		
Total Gate Charge	Q_g	V_{DS} =20V, V_{GS} =10V, I_D =10A		31.5		nC
Gate-Source Charge	Q_{gs}			5		
Gate-Drain Charge	Q_{gd}			10		
Turn-on delay time	$t_{d(on)}$	V_{DS} =20V, V_{GS} =10V, I_D =10A R_G =3Ω		6		nS
Turn-on rise time	t_r			16		
Turn-off delay time	$t_{d(off)}$			31		
Turn-off fall time	t_f			15		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				50	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =1A, T_J =25℃			1.2	V
Reverse recover time	T_{rr}	I_S =10A, di/dt =-100A/us T_J =25℃		31		nS
Reverse recovery charge	Q_{rr}			23		nC

Notes:

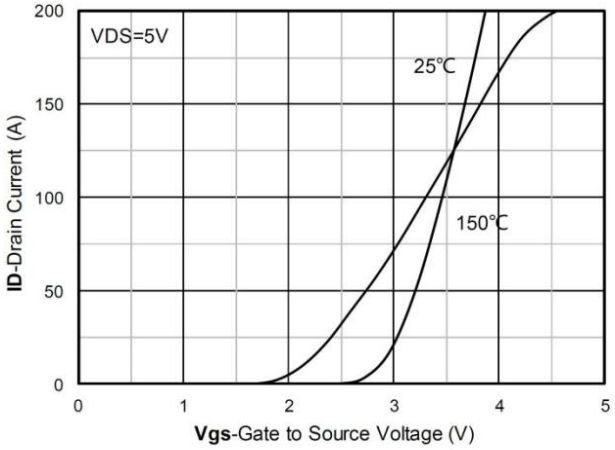
1) The EAS test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,R_G=25Ω.

2) Guaranteed by design, not subject to production.

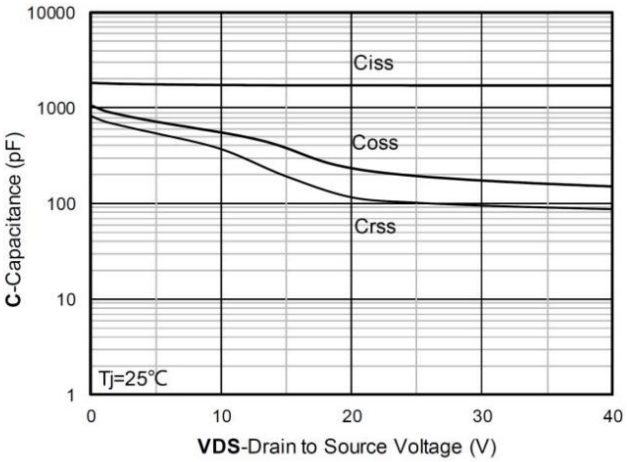
Typical Characteristics



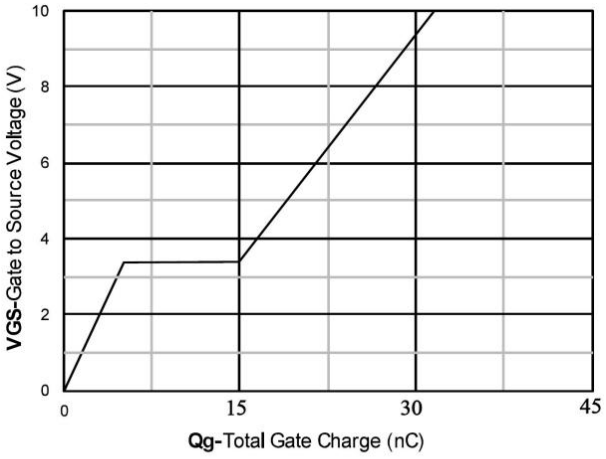
Output Characteristics



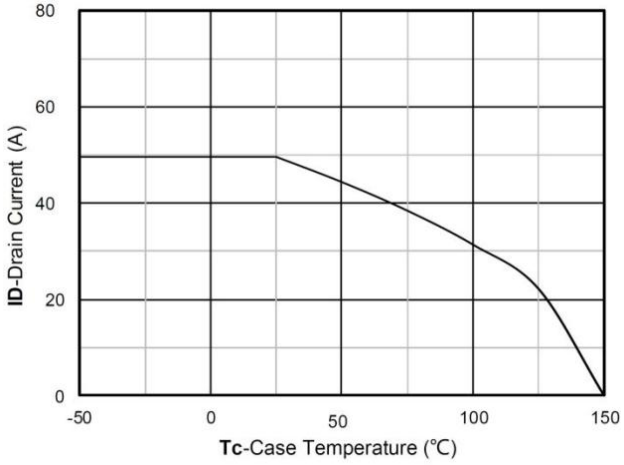
Transfer Characteristics



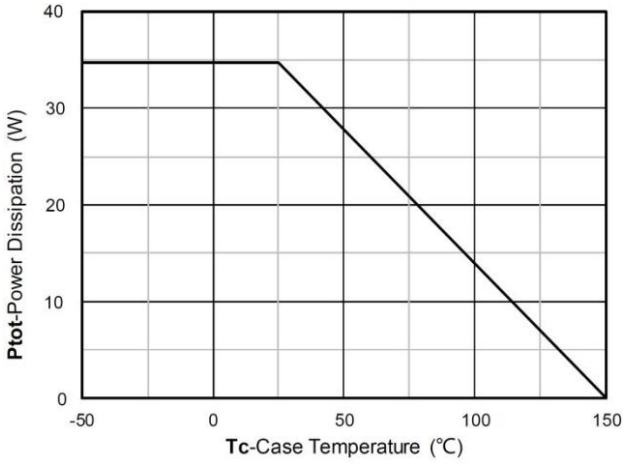
Capacitance Characteristics



Gate Charge

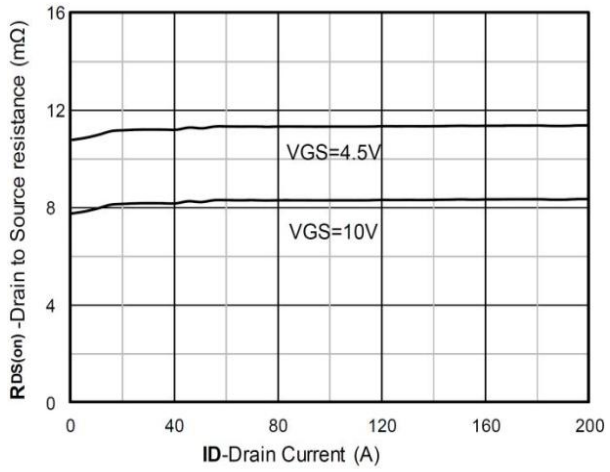


Current dissipation

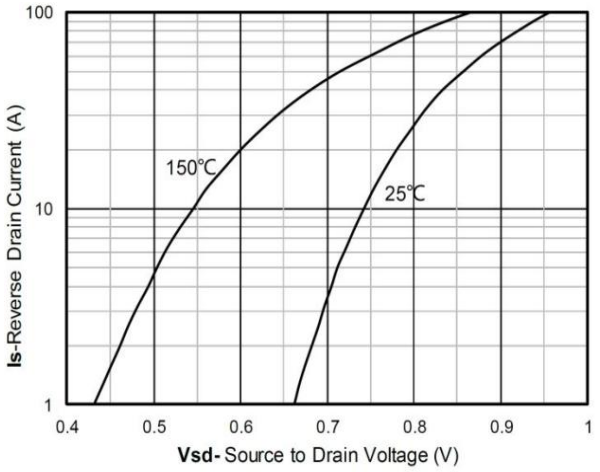


Power dissipation

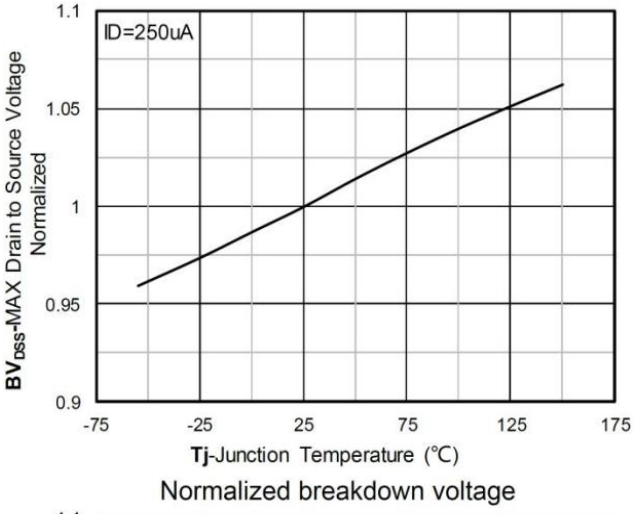
Typical Characteristics



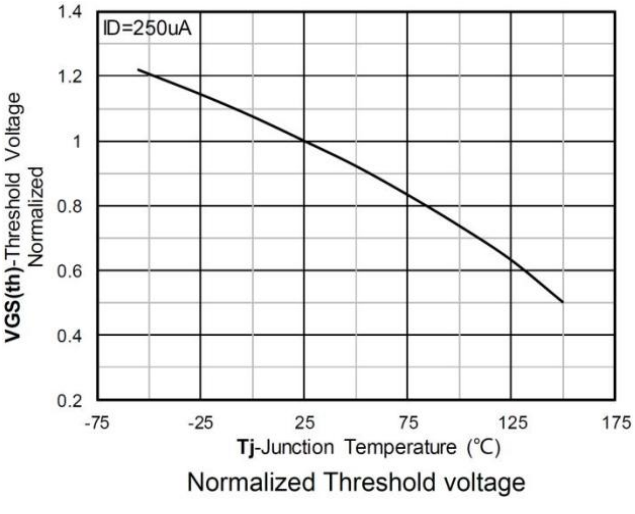
RDS(on) VS Drain Current



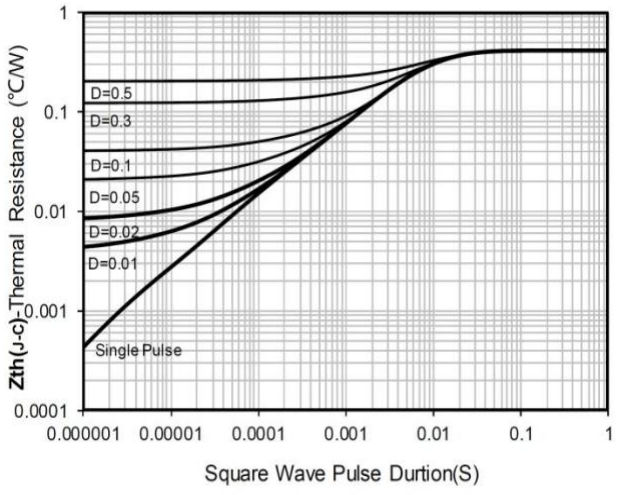
Forward characteristics of reverse diode



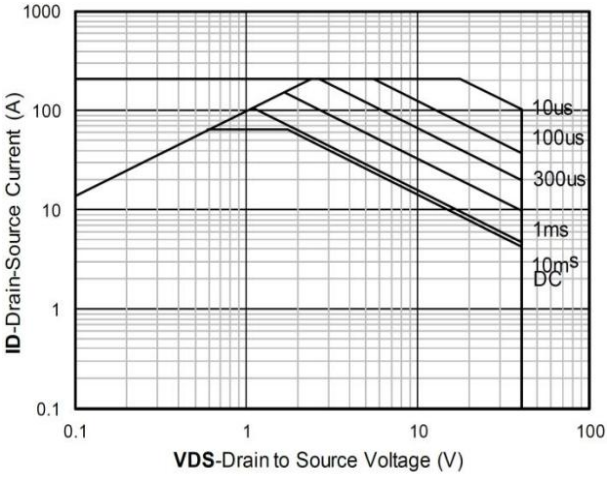
Normalized breakdown voltage



Normalized Threshold voltage

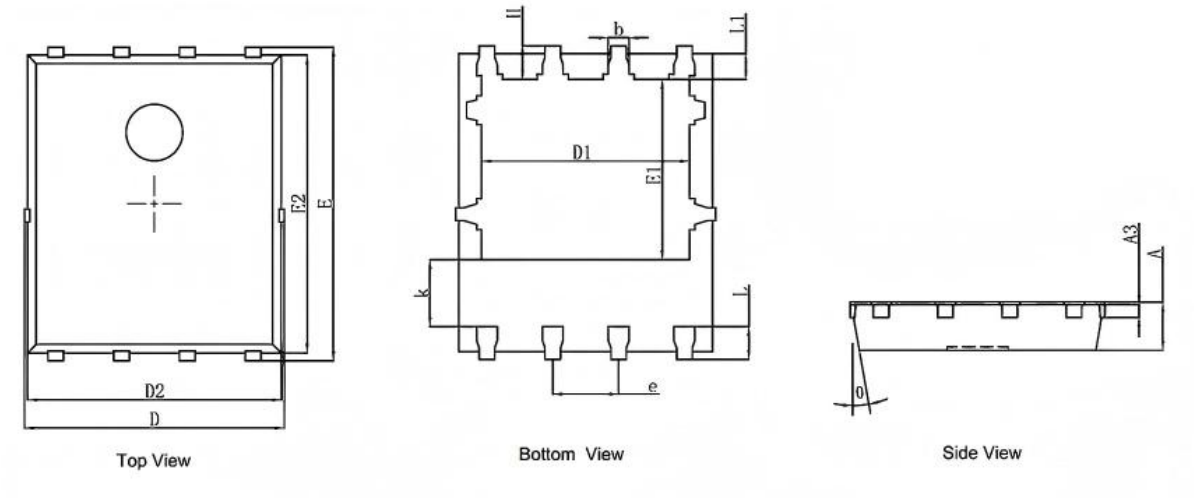


Maximum Transient Thermal Impedance



Safe Operation Area

PDFN5*6-8L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.245 REF.		0.010 REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270 TYP.		0.050 TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°