AT040SP030MPT

P-Channel Enhancement Mode MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-30V	16mΩ@-10V	-40A
	20mΩ@-4.5V	

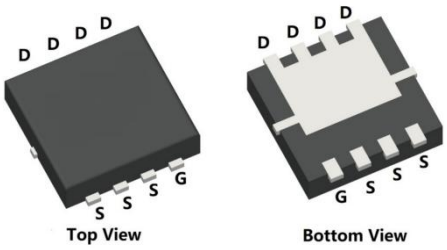
Feature

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

Application

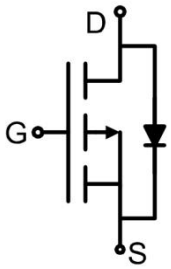
- Lithium battery protection
- Wireless impact
- Mobile phone fast charging

Package

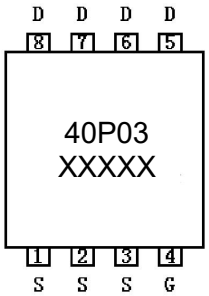


PDFN3.3*3.3-8L

Circuit diagram



Marking



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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1] (V_{GS} =-10V, T_A=25℃)	I_D	-40	A
Continuous Drain Current[1] (V_{GS} =-10V, T_A=70℃)	I_D (70℃)	-23	A
Pulsed Drain Current	I_{DM}	-120	A
Single Pulse Avalanche Energy[2]	E_{AS}	68	mJ
Power Dissipation[3] (T_A=25℃)	P_D	3.1	W
Thermal Resistance Junction to Ambient[1]	$R_{\theta JA}$	40	℃/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	-30			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-30V, 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	-1.2	-1.5	-2.5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-10A		10.5	16	mΩ
		V_{GS} =-4.5V, I_D =-5A		16	20	
Dynamic characteristics[4]						
Input Capacitance	C_{iss}	V_{DS} =-24V, V_{GS} =0V, f =1MHz		2130		pF
Output Capacitance	C_{oss}			280		
Reverse Transfer Capacitance	C_{rss}			252		
Total Gate Charge	Q_g	V_{DS} =-24V, V_{GS} =-10V, I_D =-1A		22		nC
Gate-Source Charge	Q_{gs}			4		
Gate-Drain Charge	Q_{gd}			5.8		
Turn-on delay time	$t_{d(on)}$	V_{DS} =-24V, V_{GS} =-10V, I_D =-1A, R_G =7Ω		9		nS
Turn-on rise time	t_r			13		
Turn-off delay time	$t_{d(off)}$			48		
Turn-off fall time	t_f			20		
Source-Drain Diode characteristics						
Diode Forward Current	I_S				-40	A
Diode Forward voltage	V_{SD}	V_{GS} =0V, I_S =-1A			-1.2	V

Notes:

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

2) The EAS data shows Max. rating . The test condition is V_{DD} =-24V, V_{GS} =-10V, R_G=7Ω, L=0.1mH, I_{AS} =-29.5A.

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

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

Typical Characteristics

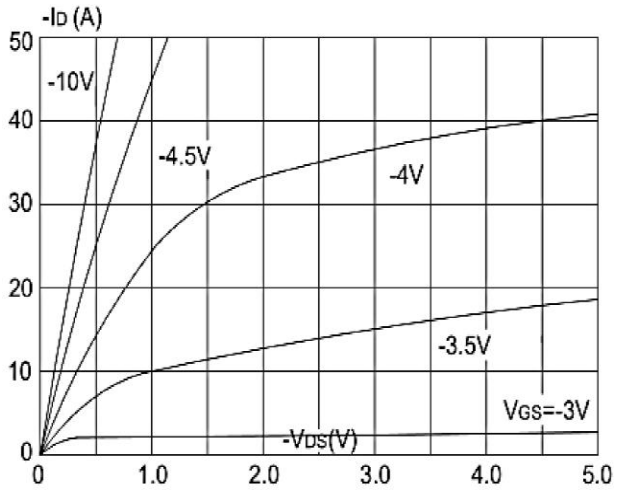


Figure1: Output Characteristics Figure

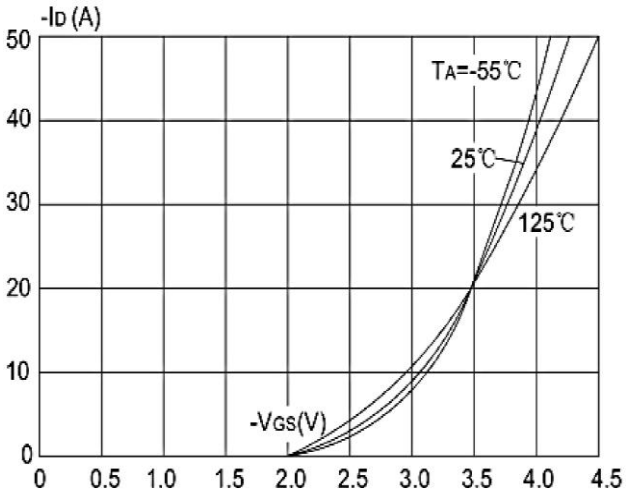


Figure2: Typical Transfer Characteristics

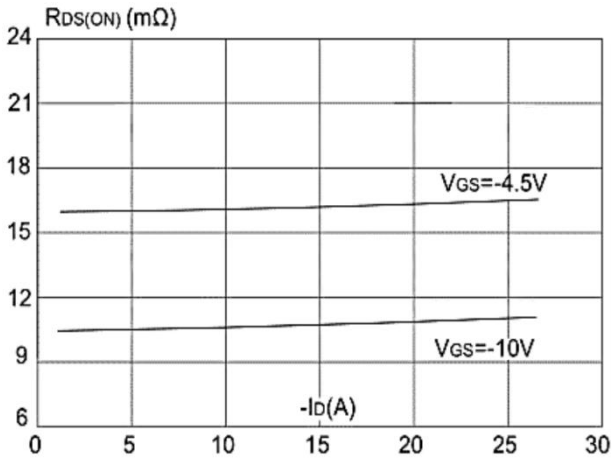


Figure 3:On-resistance vs. Drain Current

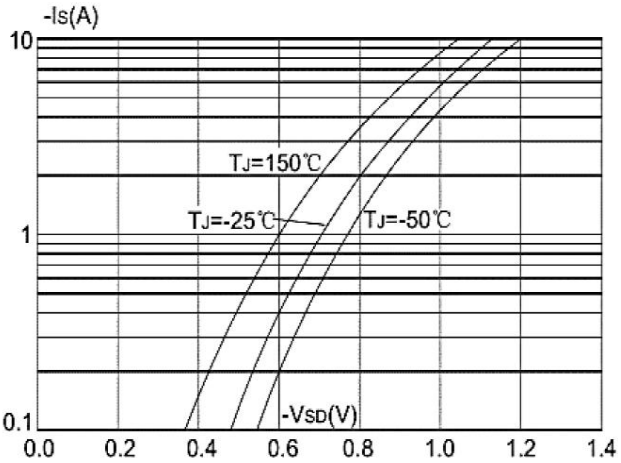


Figure 4: Body Diode Characteristics

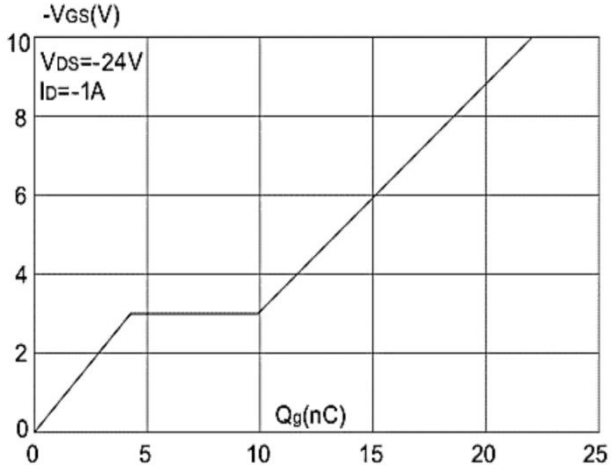


Figure 5: Gate Charge Characteristics

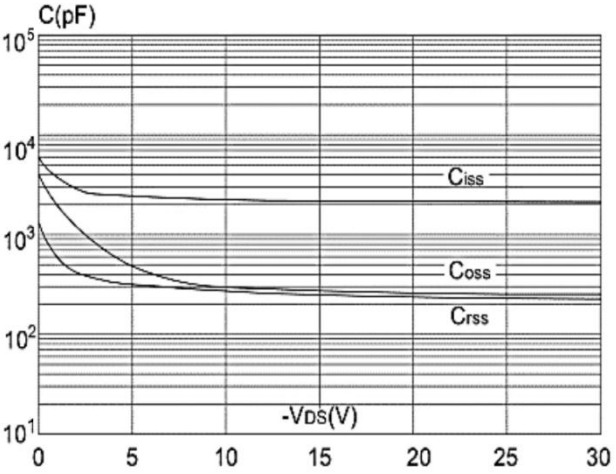


Figure 6: Capacitance Characteristics

Typical Characteristics

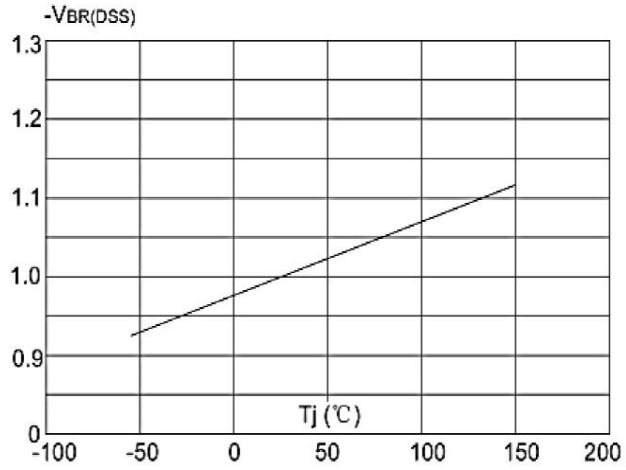


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

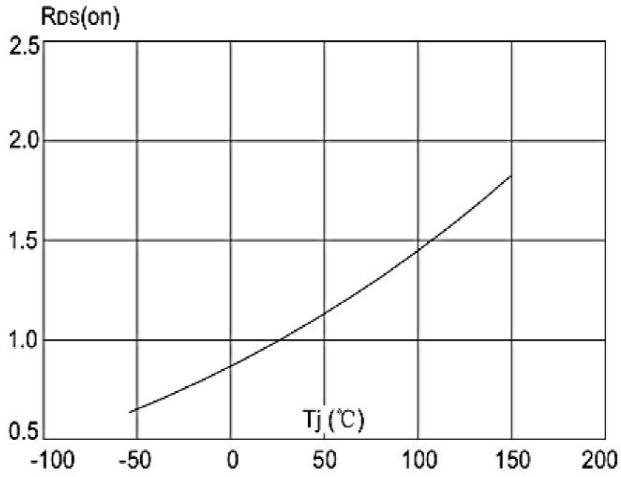


Figure 8: Normalized on Resistance vs. Junction Temperature

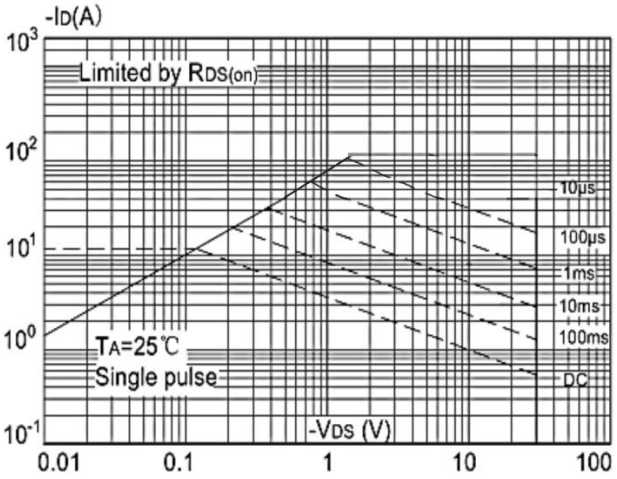


Figure 9: Maximum Safe Operating Area

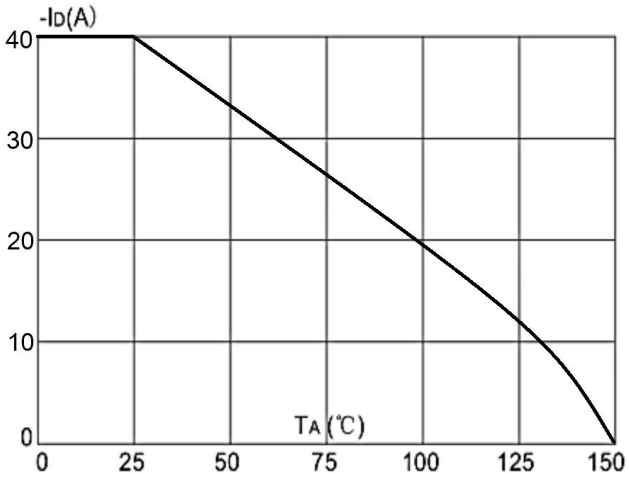


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

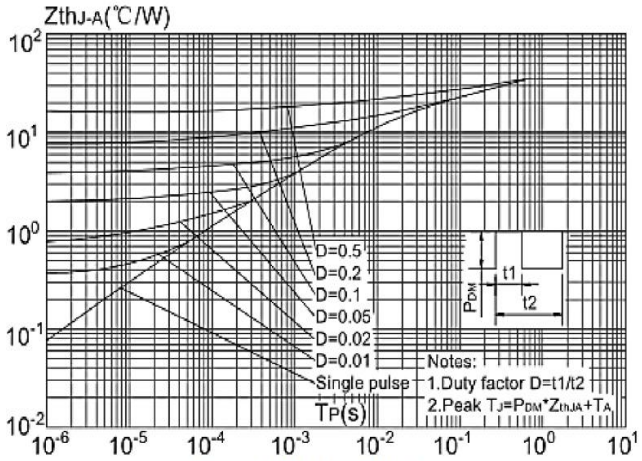
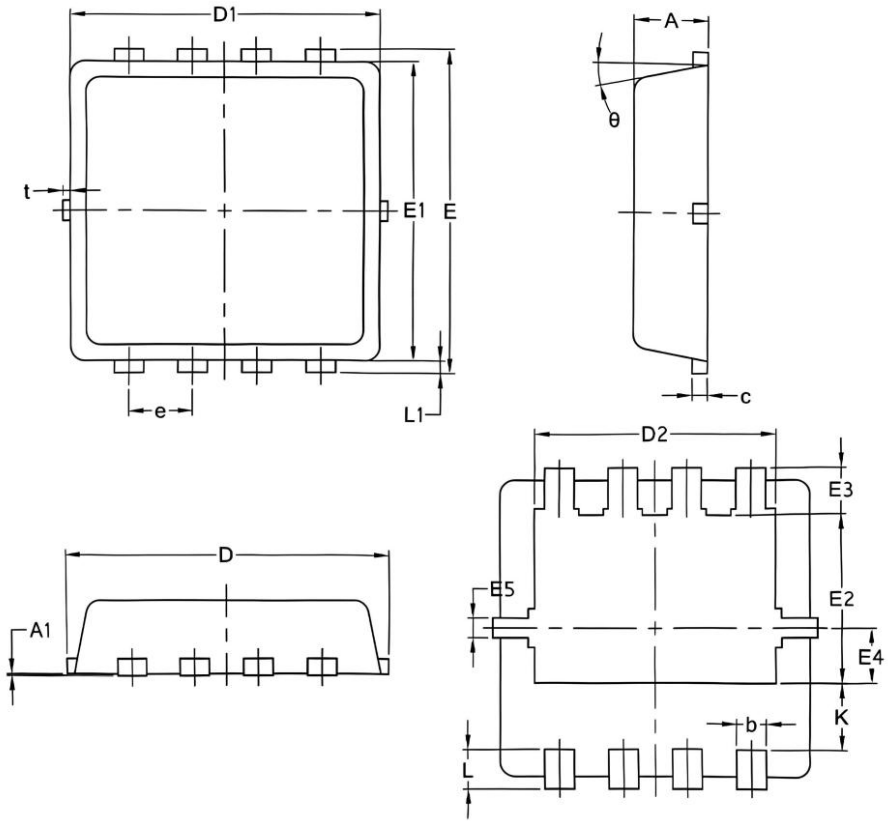


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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
θ	10°	14°	10°	14°