

TN50P40DN

P-Channel Enhancement Mode Power MOSFET

Product Summary

- $V_{DS} = -40V, I_D = -50A$
- $R_{DS(on)} < 11.5m\Omega @ V_{GS} = -10V$
- $R_{DS(on)} < 17.5m\Omega @ V_{GS} = -4.5V$

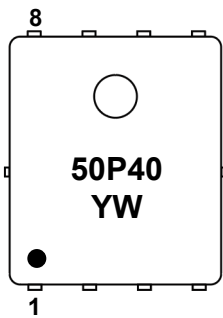
Features

- Advanced Trench Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

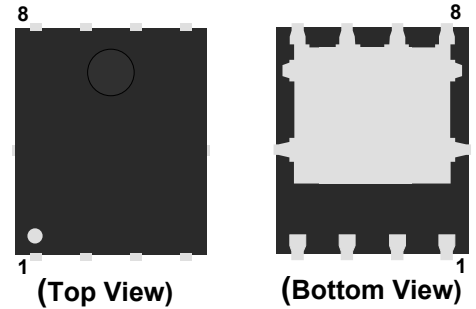
Application

- Battery Protection
- Load Switch
- Uninterruptible power supply

Marking Code

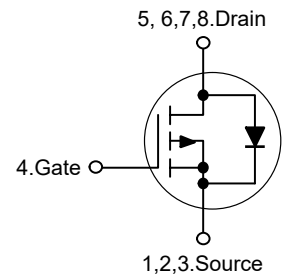


PDFN5x6-8L



Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25°C case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	$-I_D$	50	A
Drain Current-Pulsed ^{Note1}	$-I_{DM}$	160	A
Maximum Power Dissipation	P_D	52	W
Single Pulse Avalanche Energy ^{Note2}	E_{AS}	90	mJ
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.4	°C/W
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Electrical Characteristics

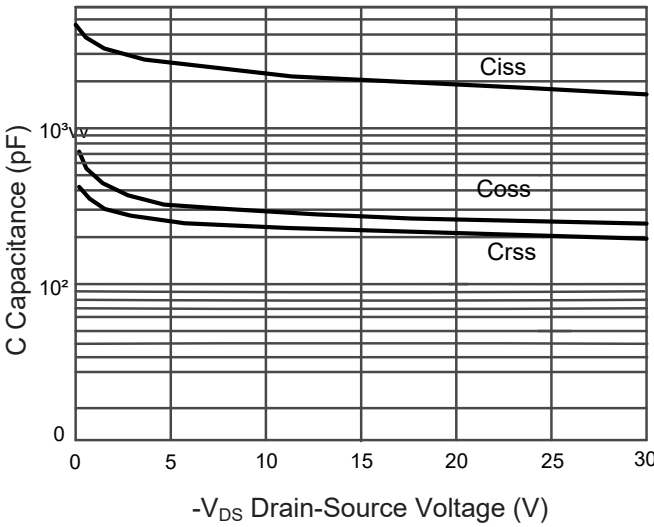
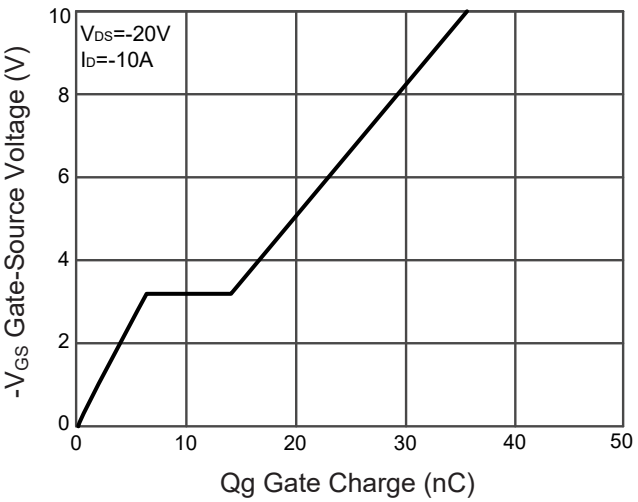
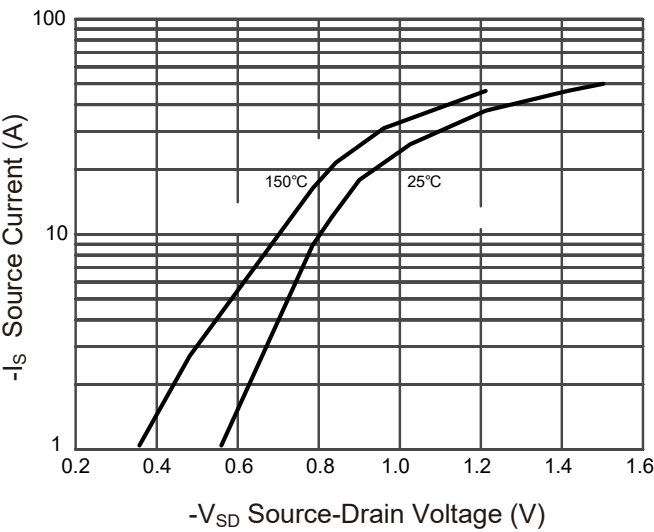
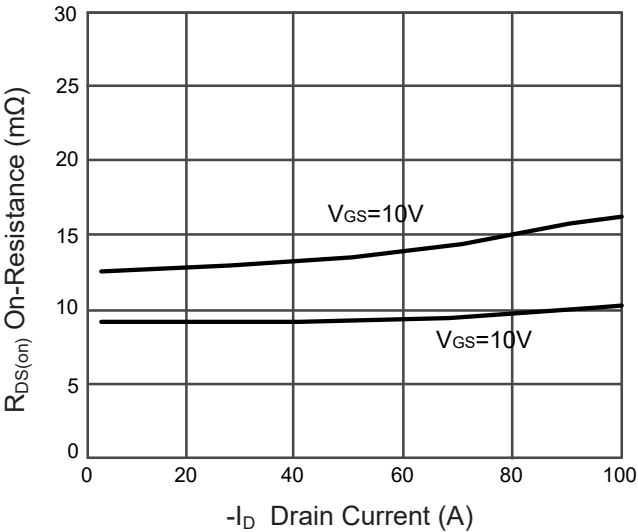
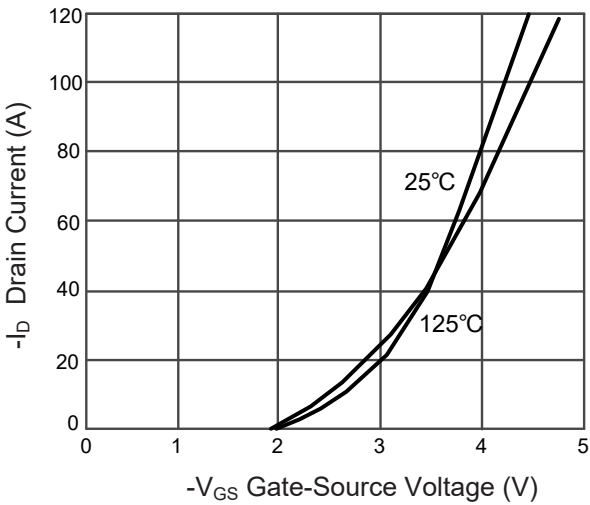
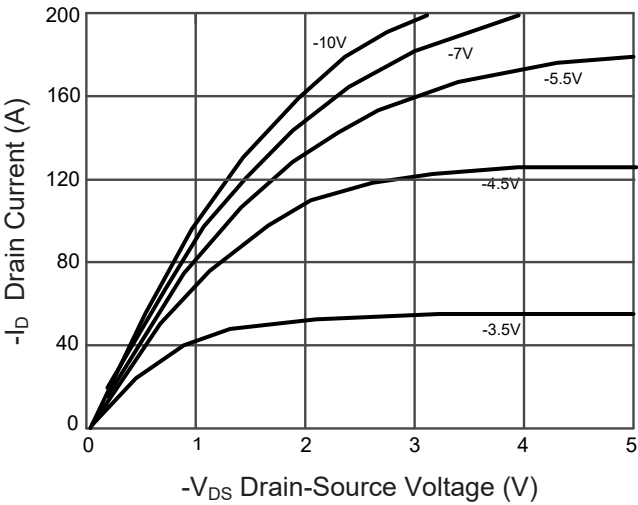
(T_J=25°C unless otherwise specified)

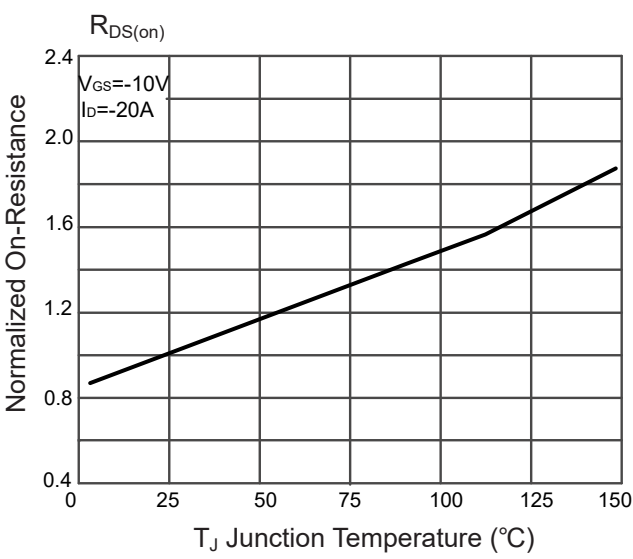
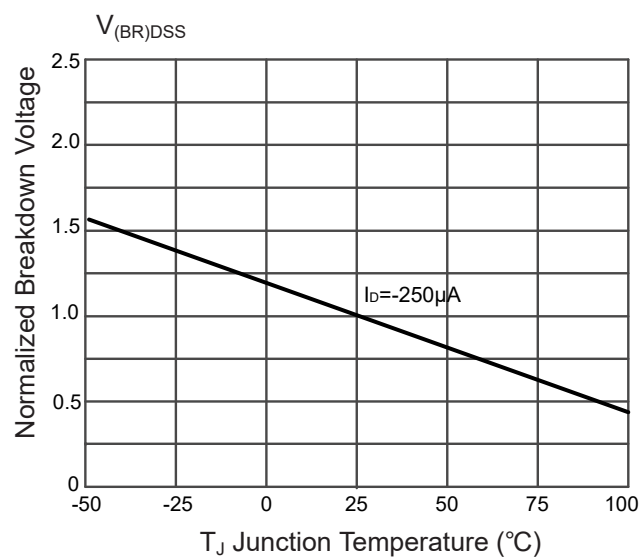
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$-V_{(BR)DSS}$	$V_{GS}=0V, I_D=-250\mu A$	40	--	--	V
Zero Gate Voltage Drain Current	$-I_{DSS}$	$V_{DS}=-40V, V_{GS}=0V$	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage ^{Note3}	$-V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	1	1.6	2.5	V
Drain-Source On-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-20A$	--	--	11.5	m Ω
		$V_{GS}=-4.5V, I_D=-20A$	--	--	17.5	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=-20V, V_{GS}=0V, f=1MHz$	--	1997	--	pF
Output Capacitance	C_{oss}		--	258	--	pF
Reverse Transfer Capacitance	C_{rss}		--	205	--	pF
Total Gate Charge	Q_g	$V_{DS}=-20V, I_D=-10A$ $, V_{GS}=-10V$	--	35	--	nC
Gate-Source Charge	Q_{gs}		--	6.2	--	nC
Gate-Drain Charge	Q_{gd}		--	7.3	--	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-20V, I_D=-10A,$ $V_{GS}=-10V, R_{GEN}=2.5\Omega$	--	10	--	nS
Turn-on Rise Time	t_r		--	20	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	51	--	nS
Turn-off Fall Time	t_f		--	28	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	$-V_{SD}$	$V_{GS}=0V, I_S=-10A$	--	--	1.2	V
Diode Forward Current	$-I_S$		--	--	50	A

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. E_{AS} Condition: T_J=25°C, V_{DD}=-20V, V_G=-10V, R_G=25 Ω , L=0.5mH, I_{AS}=-19A.3. Pulse Test: Pulse width $\leq$ 300 μ s, duty cycle $\leq$ 2%.

Typical Characteristic Curves

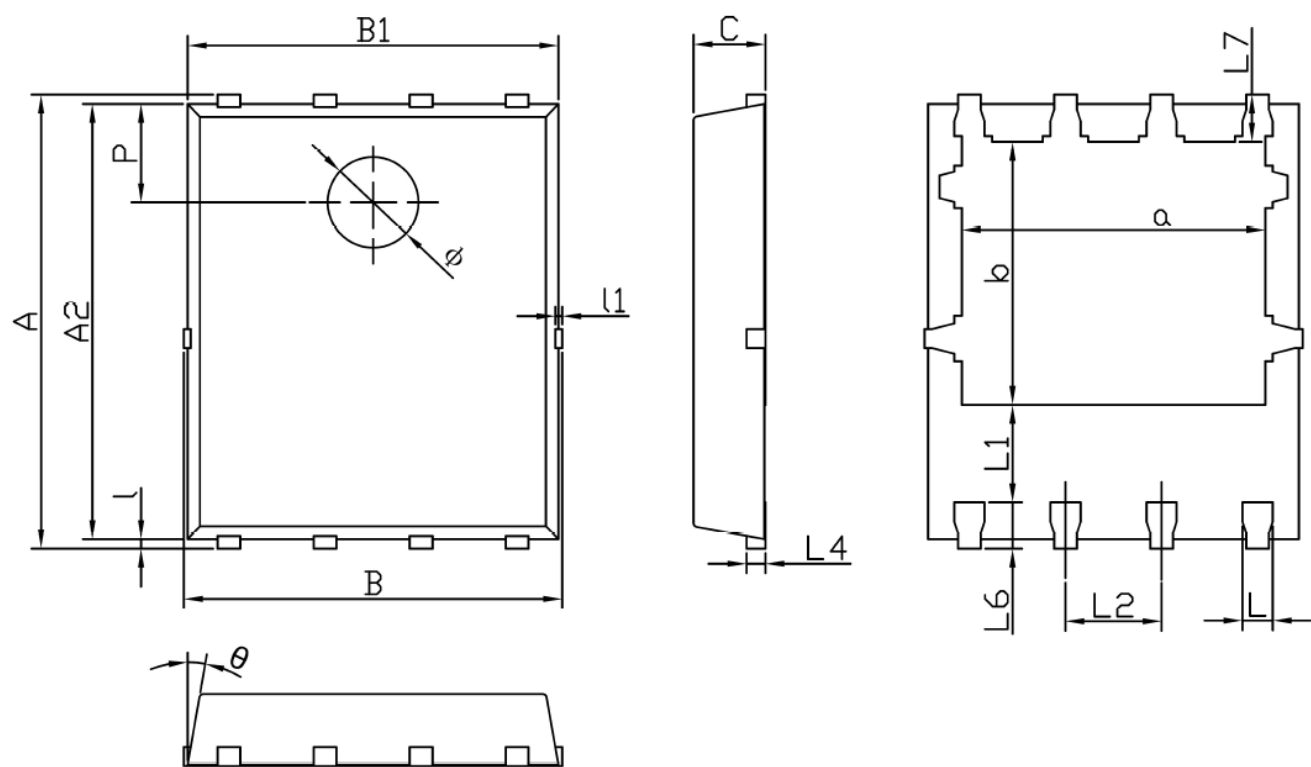




Package Outline

PDFN5x6-8L

Dimensions in mm



Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	5.90	6.10	L1	1.10	-
a	3.91	4.11	l1	-	0.10
A2	5.70	5.80	L2	1.17	1.37
B	4.90	5.10	L4	0.21	0.34
b	3.375	3.575	L6	0.51	0.71
B1	4.80	5.00	L7	0.51	0.71
C	0.90	1.00	P	1.15	1.45
L	0.30	0.50	θ	8°	12°
l	0.06	0.20	Φ	1.10	1.30

Contact Information

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For additional information, please contact your local Sales Representative.



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