

# TN150N40DN

## N-Channel Enhancement Mode Power MOSFET

### Product Summary

- $V_{DS} = 40V, I_D = 150A$
- $R_{DS(on)} < 4.2m\Omega @ V_{GS} = 10V$

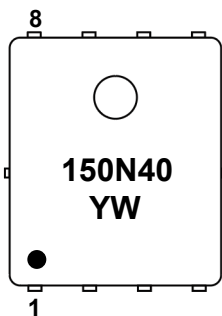
### Features

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

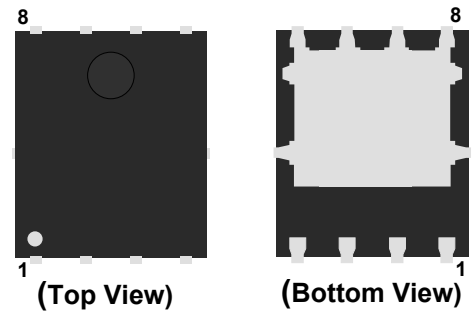
### Application

- Consumer electronic power supply
- Synchronous-rectification
- Isolated DC

### Marking Code

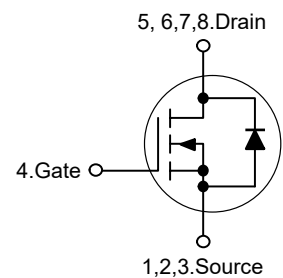


### PDFN5x6-8L



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	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous <sup>Note1</sup>	$I_D$	150	A
Drain Current-Pulsed <sup>Note3</sup>	$I_{DM}$	600	A
Maximum Power Dissipation <sup>Note2</sup>	$P_D$	96	W
Single Pulse Avalanche Energy <sup>Note3</sup>	$E_{AS}$	400	mJ
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	-55 to +150	°C

### Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.3	°C/W
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## Electrical Characteristics

(T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage	V <sub>(BR) DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =1mA		40	-	-	V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =32V, V <sub>GS</sub> =0V	T <sub>J</sub> =25℃	-	-	1.0	μA
			T <sub>J</sub> =125℃	-	-	100	
Gate-body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V		-	-	±100	nA
On characteristics <sup>④</sup>							
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA		1.0	1.8	2.5	V
Static drain-source on-sate resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A		-	1.6	2.0	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =30A		-	2.4	3.6	mΩ
Dynamic characteristics							
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f =100kHz		-	3060	-	pF
Output capacitance	C <sub>oss</sub>			-	900	-	
Reverse transfer capacitance	C <sub>rss</sub>			-	52	-	
Gate resistance	R <sub>g</sub>	f =1MHz		-	5	-	Ω
Switching characteristics							
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> =4.5V, V <sub>DS</sub> =20V, I <sub>D</sub> =75A		-	19.3	-	nC
Total gate charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =20V, I <sub>D</sub> =75A		-	42.8	-	
Gate-source charge	Q <sub>gs</sub>			-	9.3	-	
Gate-drain charge	Q <sub>gd</sub>			-	7.4	-	
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DS</sub> =20V, V <sub>GS</sub> =10V, R <sub>L</sub> =0.27Ω , R <sub>g</sub> =1.6Ω		-	10	-	ns
Turn-on rise time	t <sub>r</sub>			-	2.4	-	
Turn-off delay time	t <sub>d(off)</sub>			-	45	-	
Turn-off fall time	t <sub>f</sub>			-	22.5	-	
Drain-Source Diode Characteristics							
Drain-source diode forward voltage	V <sub>SD</sub> <sup>④</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =30A		-	-	1.3	V
Continuous drain-source diode forward current	I <sub>S</sub> <sup>①</sup>			-	-	150	A
Pulsed drain-source diode forward current	I <sub>SM</sub> <sup>①②</sup>			-	-	600	A
Reverse recovery time	t <sub>rr</sub>	di <sub>S</sub> /dt = 100A/μs, I <sub>S</sub> = 30A, V <sub>DD</sub> = 30V		-	65	-	ns
Reverse recovery charge	Q <sub>rr</sub>			-	90	-	nC

Notes:

1. T<sub>C</sub> = 25°C.

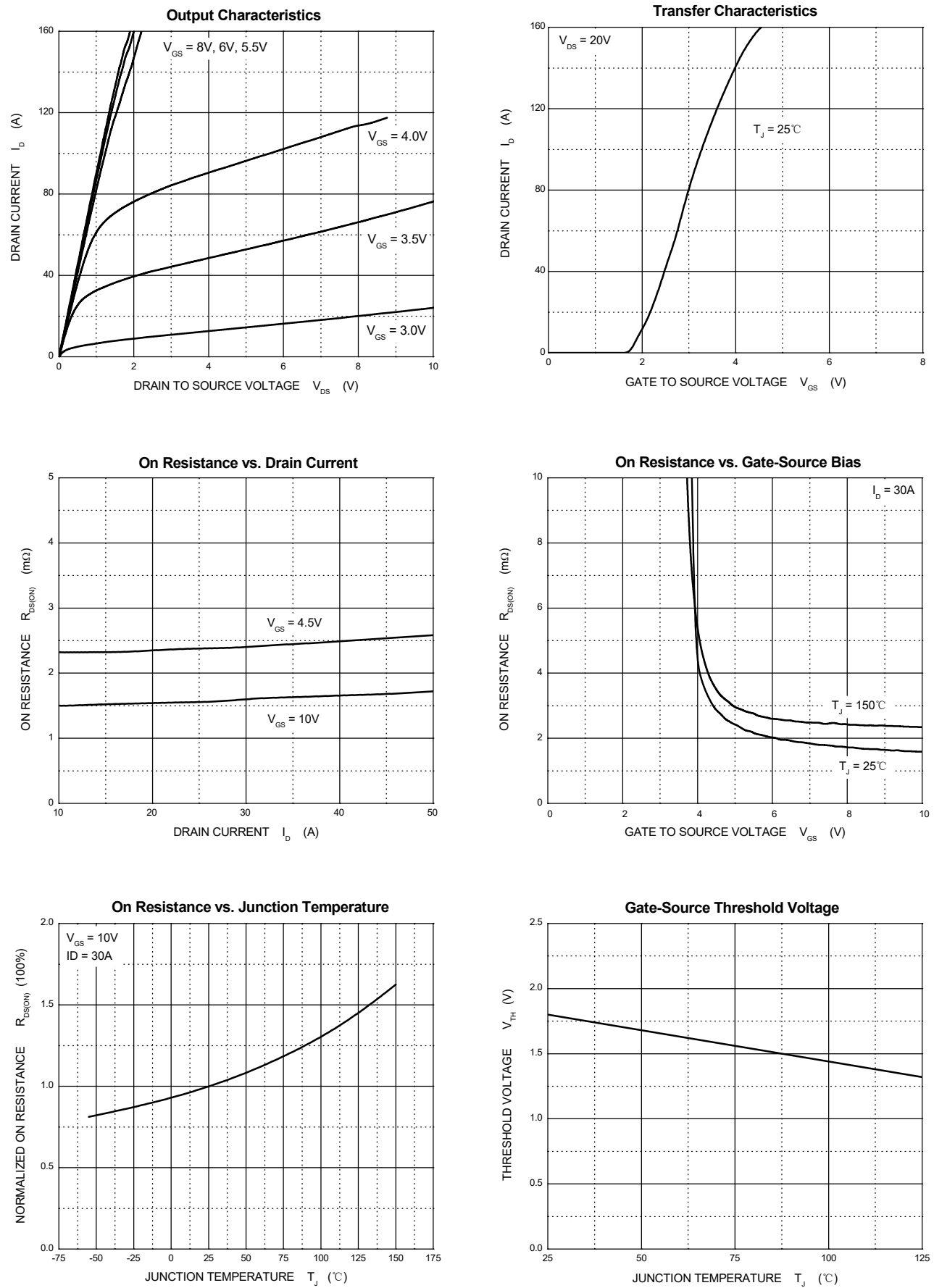
2. Limited only by maximum temperature allowed.

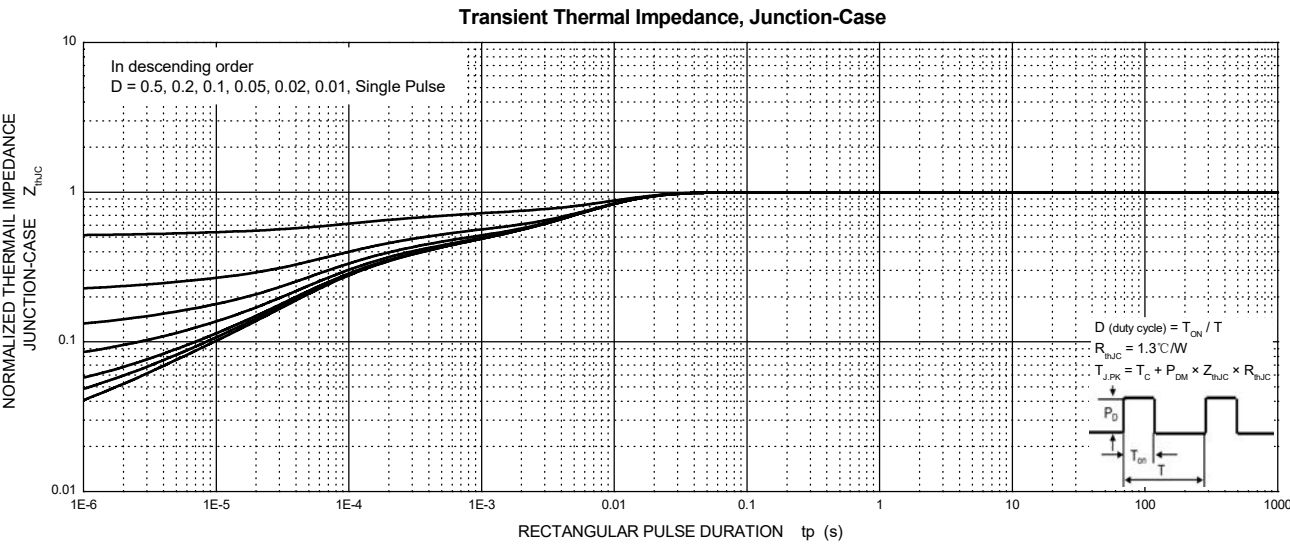
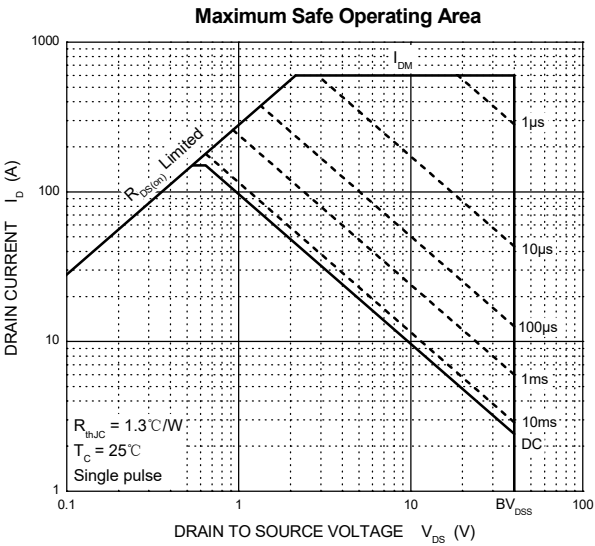
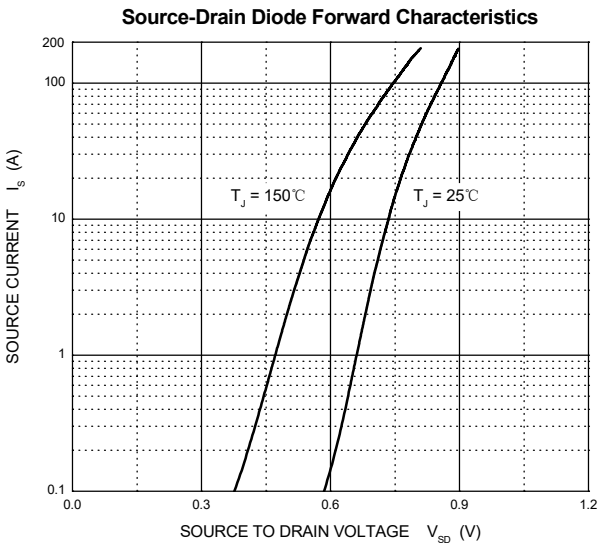
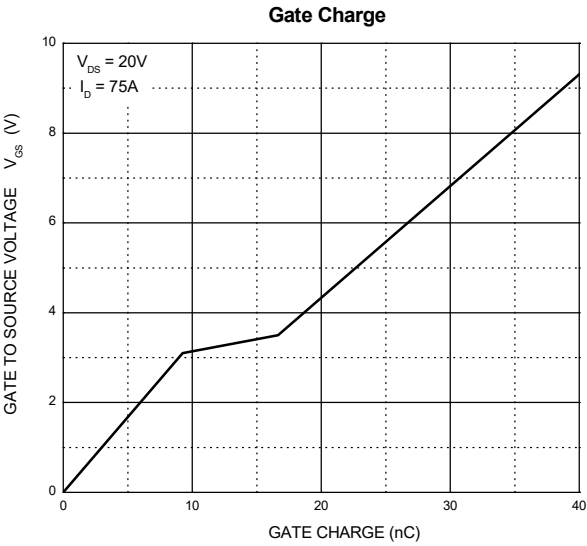
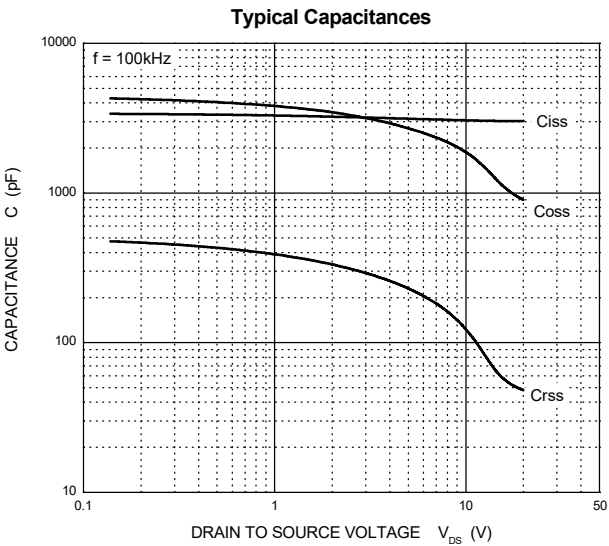
3. V<sub>DD</sub> = 20V, V<sub>GS</sub> = 10V, L = 0.5mH, R<sub>g</sub> = 25Ω Starting T<sub>J</sub> = 25°C.

4. Pulse Test : Pulse Width ≤ 380μs, duty cycle ≤ 2%.

5. Device mounted on 1 in<sup>2</sup> FR-4 board with 2oz. single-sided Copper, in a still air environment with T<sub>A</sub> = 25°C.

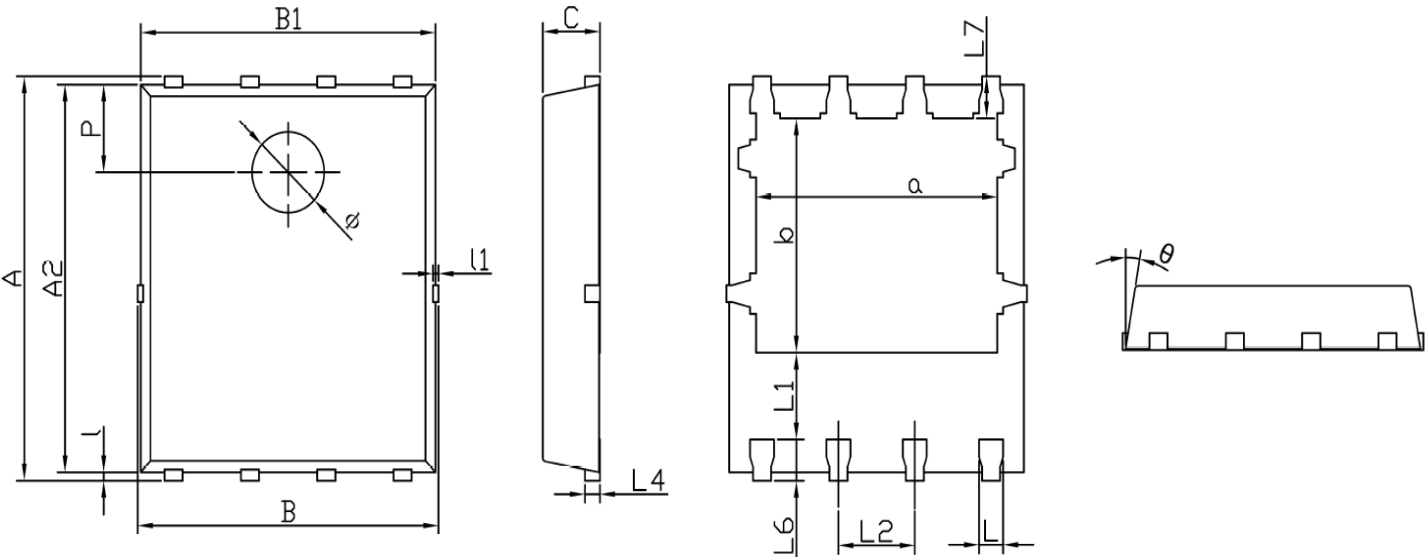
Typical Characteristic Curves





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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