TNG140N40DN

N-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= 60V,I_D= 50A
- $R_{DS(on)}$= 2mΩ @V_{GS}= 10V
- $R_{DS(on)}$=3.2mΩ @V_{GS}= 4.5V

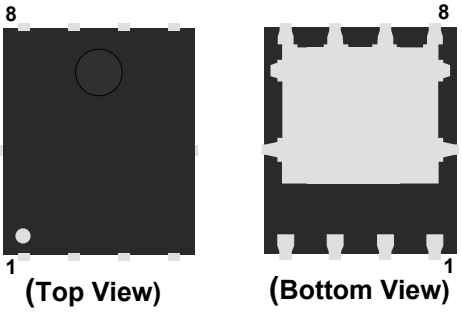
Features

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

Application

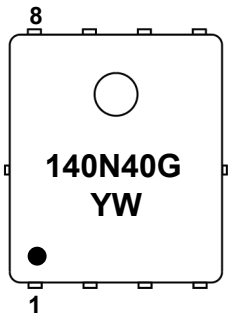
- Synchronous Rectifiers
- H-bridge Motor Drive

PDFN5x6-8L

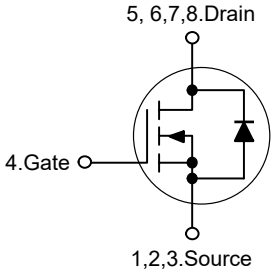


Pin	Description
1,2,3	Source
4	Gate
5,6,7,8	Drain

Marking Code



Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		40	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	140	A
		T_C = 100℃	88	A
I_{DM}	Pulsed Drain Current note1		180	A
E_{AS}	Single Pulsed Avalanche Energy note2		360	mJ
P_D	Power Dissipation	T_C = 25℃	142	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		0.88	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	℃

Electrical Characteristics

(T_J=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	40	---	---	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=40V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=125℃	---	---	10	uA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
On Characteristics						
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=10V , I_D=30A	---	1.9	2.2	mΩ
		V_{GS}=4.5V , I_D=20A	---	2.5	3	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1	1.6	2.5	V
gfs	Forward Transconductance	V_{DS}=10V , I_D=10A	---	45	---	S
Dynamic and switching Characteristics						
Q_g	Total Gate Charge[3,4]	V_{DS}=20V , V_{GS}=4.5V , I_D=10A	---	70	140	nC
Q_{gs}	Gate-Source Charge[3,4]		---	15	32	
Q_{gd}	Gate-Drain Charge[3,4]		---	40	80	
$T_{d(on)}$	Turn-On Delay Time[3,4]	V_{DD}=20V , V_{GS}=10V , R_G=10Ω I_D=10A	---	24.6	48	ns
T_r	Rise Time[3,4]		---	62.8	120	
$T_{d(off)}$	Turn-Off Delay Time[3,4]		---	224	440	
T_f	Fall Time[3,4]		---	162	320	
C_{iss}	Input Capacitance	V_{DS}=25V , V_{GS}=0V , F=1MHz	---	8000	12000	pF
C_{oss}	Output Capacitance		---	550	1000	
C_{rss}	Reverse Transfer Capacitance		---	420	800	
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, F=1MHz	---	1.2	2.4	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current		---	---	140	A
I_{SM}	Pulsed Source Current		---	---	280	A
V_{SD}	Diode Forward Voltage	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1	V
t_{rr}	Reverse Recovery Time	V_{GS}=0V,I_S=20A , di/dt=100A/μs	---	32	---	ns
Q_{rr}	Reverse Recovery Charge	T_J=25℃	---	19	---	nC

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=85A., Starting T_J=25℃
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.

Typical Characteristic Curves

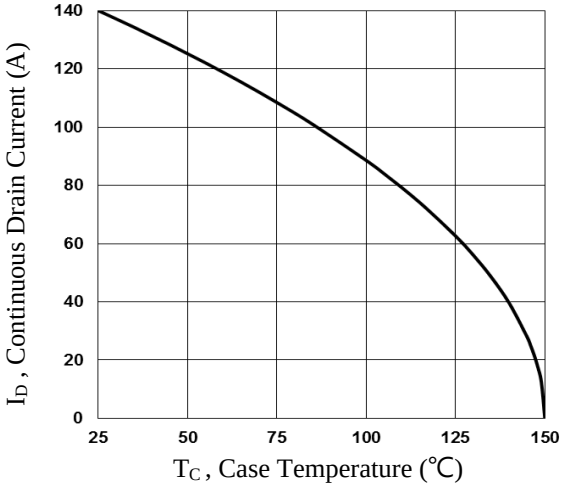


Fig.1 Continuous Drain Current vs. T_C

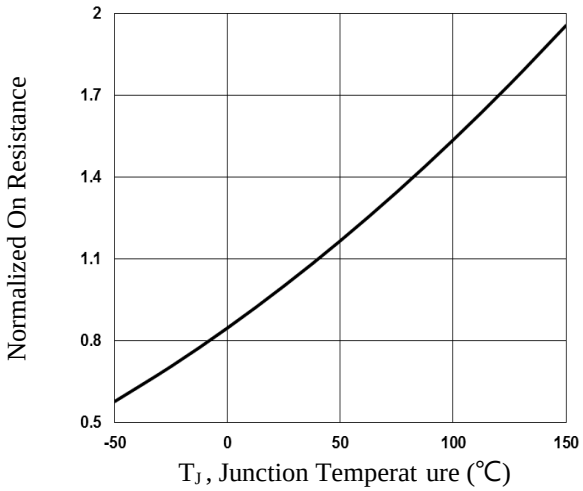


Fig.2 Normalized RDSON vs. T_J

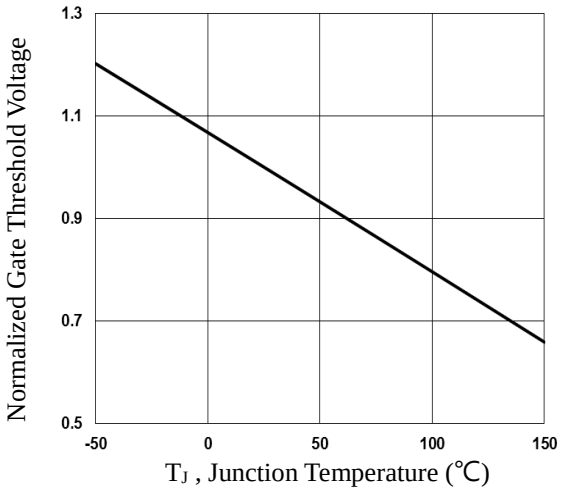


Fig.3 Normalized Vth vs. T_J

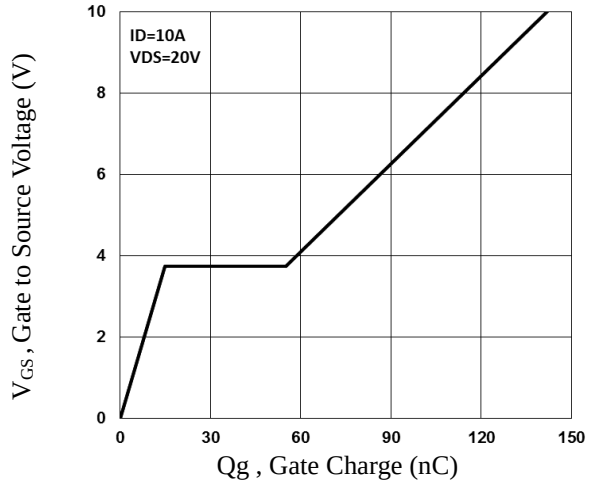


Fig.4 Gate Charge Characteristics

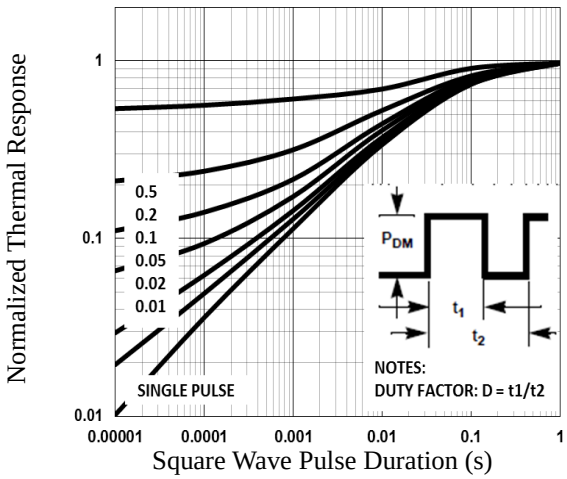


Fig.5 Normalized Transient Impedance

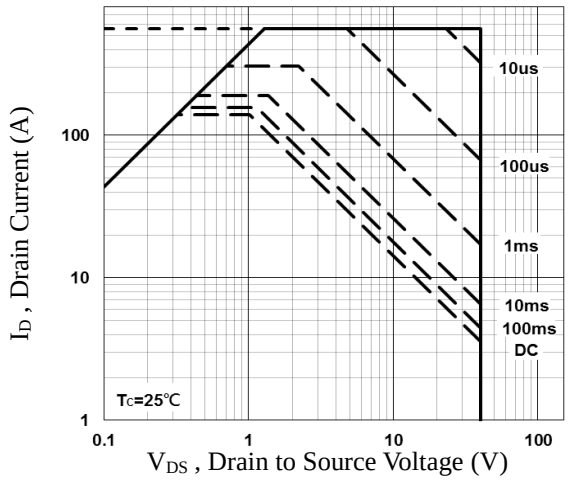
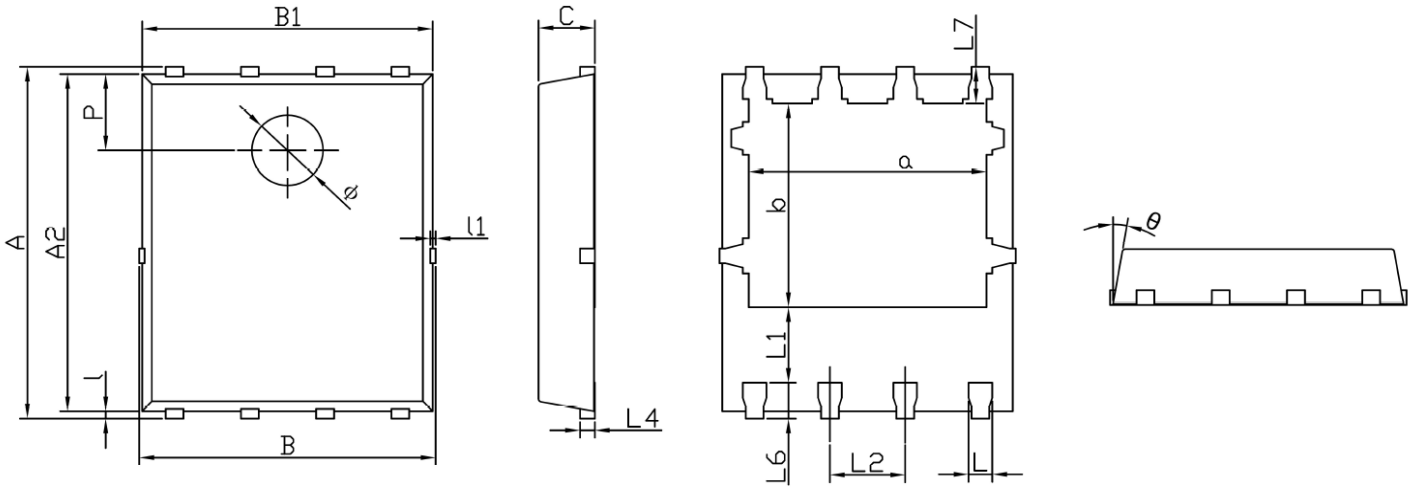


Fig.6 Maximum Safe Operation Area

Package Outline

PDFN5x6A-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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