

## Product Summary

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

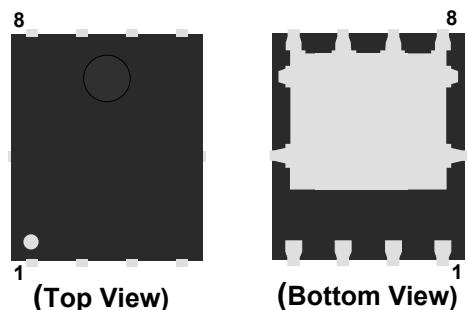
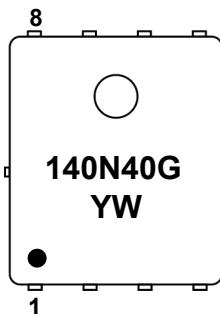
## Features

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

## Application

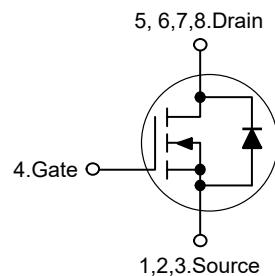
- Synchronous Rectifiers
- H-bridge Motor Drive

## Marking Code



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.

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

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V , I <sub>D</sub> =250uA	40	---	---	V
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =40V , V <sub>GS</sub> =0V , T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =32V , V <sub>GS</sub> =0V , T <sub>J</sub> =125°C	---	---	10	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V , V <sub>DS</sub> =0V	---	---	±100	nA

**On Characteristics**

R <sub>DSON</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =10V , I <sub>D</sub> =30A	---	1.9	2.2	mΩ
		V <sub>GS</sub> =4.5V , I <sub>D</sub> =20A	---	2.5	3	mΩ
V <sub>Gsth</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	1	1.6	2.5	V
g <sub>fs</sub>	Forward Transconductance	V <sub>DS</sub> =10V , I <sub>D</sub> =10A	---	45	---	S

**Dynamic and switching Characteristics**

Q <sub>g</sub>	Total Gate Charge <sup>3,4</sup>	V <sub>DS</sub> =20V , V <sub>GS</sub> =4.5V , I <sub>D</sub> =10A	---	70	140	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>3,4</sup>		---	15	32	
Q <sub>gd</sub>	Gate-Drain Charge <sup>3,4</sup>		---	40	80	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>3,4</sup>	V <sub>DD</sub> =20V , V <sub>GS</sub> =10V , R <sub>G</sub> =10Ω I <sub>D</sub> =10A	---	24.6	48	ns
T <sub>r</sub>	Rise Time <sup>3,4</sup>		---	62.8	120	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>3,4</sup>		---	224	440	
T <sub>f</sub>	Fall Time <sup>3,4</sup>		---	162	320	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V , V <sub>GS</sub> =0V , F=1MHz	---	8000	12000	pF
C <sub>oss</sub>	Output Capacitance		---	550	1000	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	420	800	
R <sub>g</sub>	Gate resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz	---	1.2	2.4	Ω

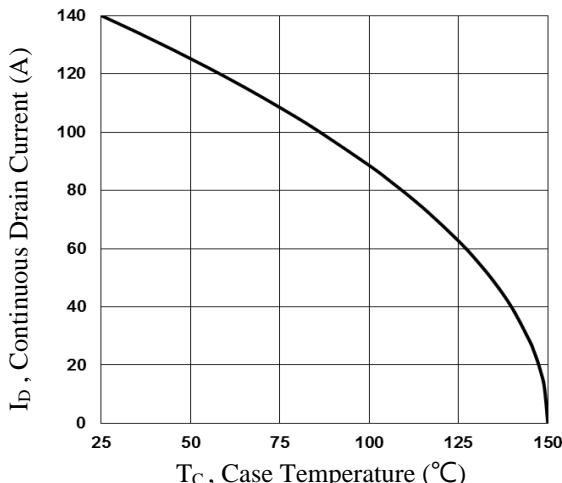
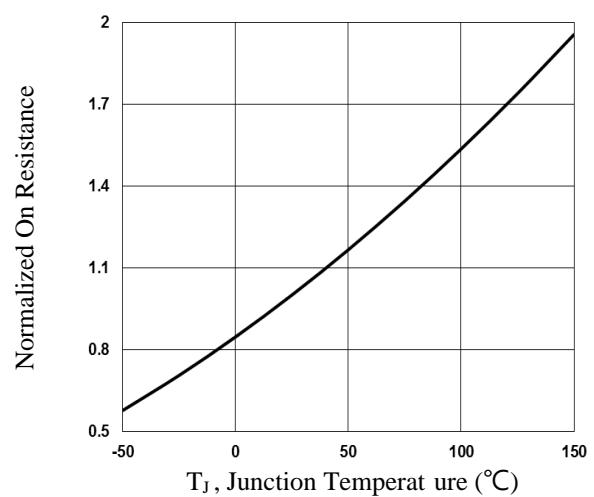
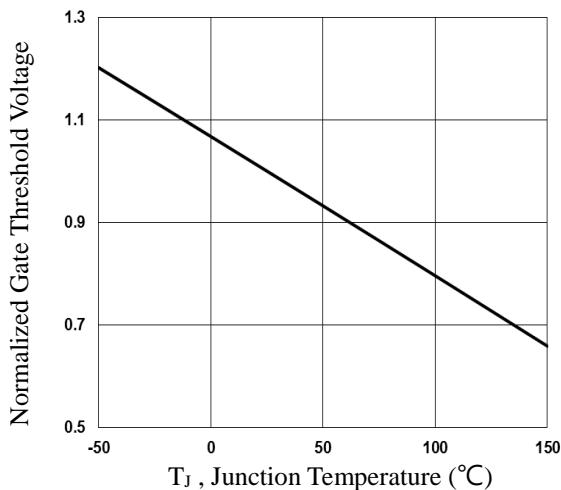
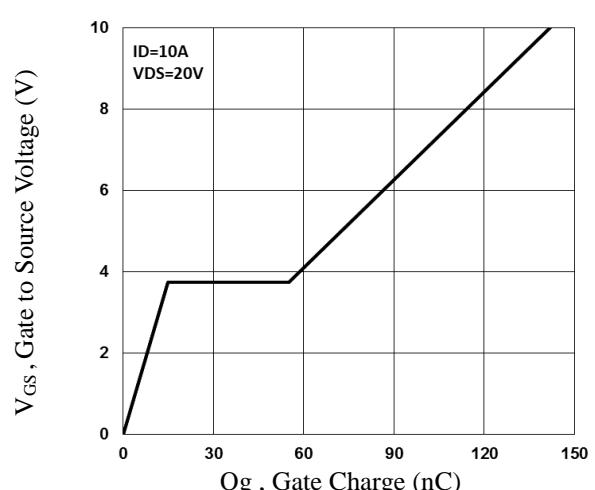
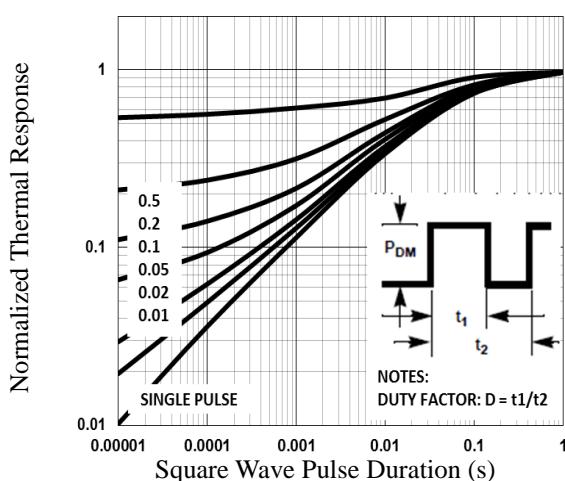
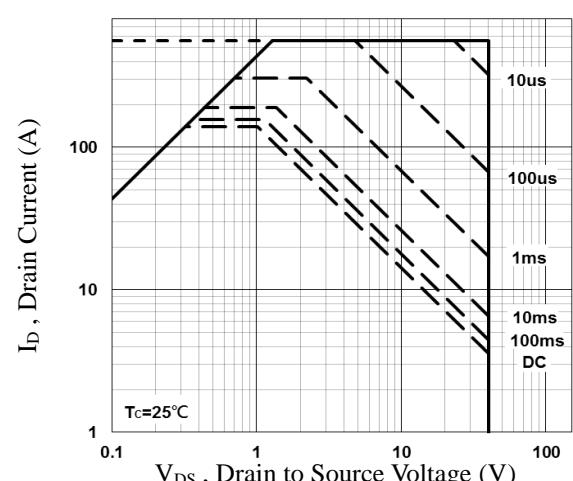
**Drain-Source Diode Characteristics and Maximum Ratings**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>s</sub>	Continuous Source Current		---	---	140	A
			---	---	280	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V , I <sub>s</sub> =1A , T <sub>J</sub> =25°C	---	---	1	V
t <sub>rr</sub>	Reverse Recovery Time	V <sub>GS</sub> =0V,I <sub>s</sub> =20A , di/dt=100A/μs T <sub>J</sub> =25°C	---	32	---	ns
			---	19	---	nC

Note :

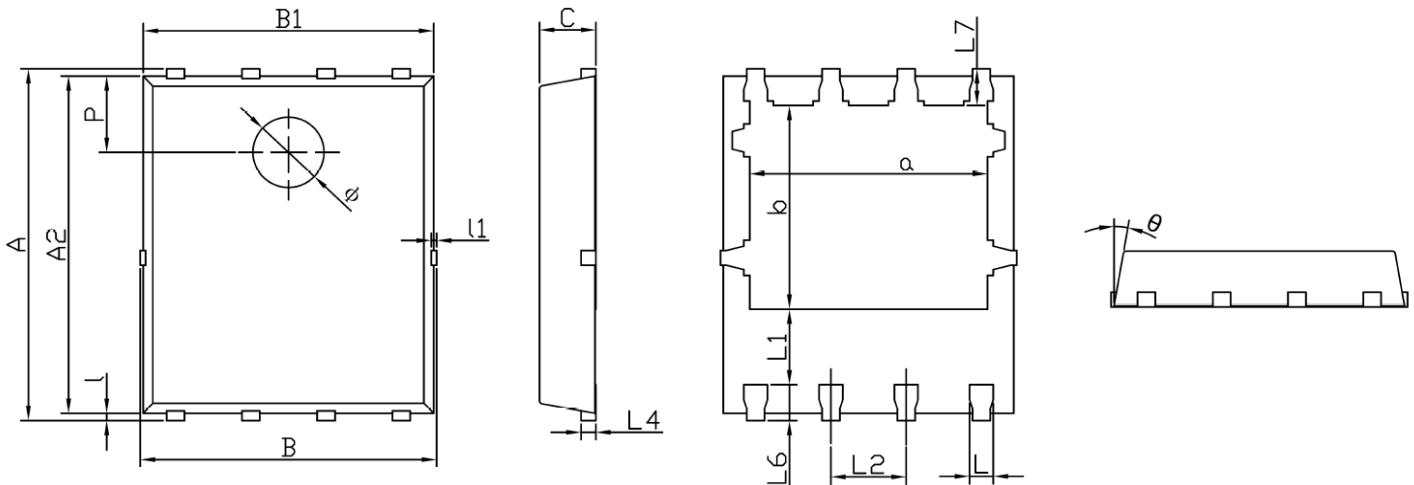
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>DD</sub>=25V,V<sub>GS</sub>=10V,L=0.1mH,I<sub>AS</sub>=85A., Starting T<sub>J</sub>=25°C
3. The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

## Typical Characteristic Curves

**Fig.1 Continuous Drain Current vs. T<sub>c</sub>****Fig.2 Normalized RD<sub>SON</sub> vs. T<sub>j</sub>****Fig.3 Normalized V<sub>th</sub> vs. T<sub>j</sub>****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	I1	-	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°
I	0.06	0.20	Φ	1.10	1.30

## Contact Information

TANI website: <http://www.tanisemi.com> Email:tani@tanisemi.com

For additional information, please contact your local Sales Representative.



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## Product Specification Statement

The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

The product parameters described in the product specification are numerical values, characteristics, and functions obtained through actual testing or theoretical calculations of the product in an independent or ideal state. Due to the complexity of product applications and variations in test conditions and equipment, there may be slight fluctuations in parameter test values. TANI shall not guarantee that the actual performance of the product when installed in the customer's system or equipment will be entirely consistent with the product specification, especially concerning dynamic parameters. It is recommended that users consult with professionals for product selection and system design. Users should also thoroughly validate and assess whether the actual parameters and performance when installed in their respective systems or equipment meet their requirements or expectations. Additionally, users should exercise caution in verifying product compatibility issues, and TANI assumes no responsibility for the application of the product. TANI strives to provide accurate and up-to-date information to the best of our ability. However, due to technical, human, or other reasons, TANI cannot guarantee that the information provided in the product specification is entirely accurate and error-free. TANI shall not be held responsible for any losses or damages resulting from the use or reliance on any information in these product specifications.

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Users are advised to pay attention to the parameter limit values specified in the product specification and maintain a certain margin in design or application to ensure that the product does not exceed the parameter limit values defined in the product specification. This precaution should be taken to avoid exceeding one or more of the limit values, which may result in permanent irreversible damage to the product, ultimately affecting the quality and reliability of the system or equipment.

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