TN50P20DL

P-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= -20V,I_D= -50A
- $R_{DS(on)}$< 7.6mΩ @V_{GS}= -4.5V
- $R_{DS(on)}$< 10mΩ @V_{GS}= -2.5V

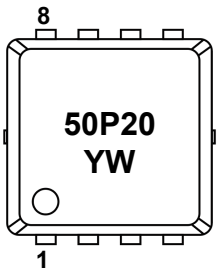
Features

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

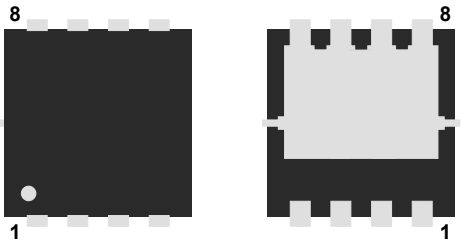
Application

- Load Switch
- PWM Application
- Power Management

Marking Code



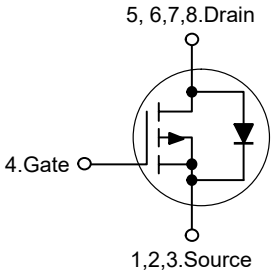
PDFN3x3-8L



(Top View) (Bottom View)

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

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ case temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$-V_{DS}$	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	$-I_D$	50	A
Drain Current-Pulsed Note1	$-I_{DM}$	220	A
Maximum Power Dissipation	P_D	42	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.98	°C/W

Electrical Characteristics

(T_C=25℃ 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=-250μA	20	--	--	V
Zero Gate Voltage Drain Current	$-I_{DSS}$	V_{DS}=-20V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note2	$-V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	0.4	--	1	V
Drain-Source On-Resistance Note2	$R_{DS(on)}$	V_{GS}=-4.5V,I_D=-15A	--	--	7.6	mΩ
		V_{GS}=-2.5V,I_D=-10A	--	--	10	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V,V_{GS}=0V,f=1MHz	--	2839	--	pF
Output Capacitance	C_{oss}		--	372	--	pF
Reverse Transfer Capacitance	C_{rss}		--	311	--	pF
Total Gate Charge	Q_g	V_{DS}=-10V,I_D=-15A, V_{GS}=-4.5V	--	54	--	nC
Gate-Source Charge	Q_{gs}		--	7	--	nC
Gate-Drain Charge	Q_{gd}		--	14	--	nC
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V, I_D=-13A, V_{GS}=-10V, R_{GEN}=3Ω	--	13	--	nS
Turn-on Rise Time	t_r		--	105	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	145	--	nS
Turn-off Fall Time	t_f		--	150	--	nS
Source-Drain Diode Characteristics						
Diode Forward Voltage Note2	$-V_{SD}$	V_{GS}=0V,I_S=-30A	--	--	1.2	V
Diode Forward Current	$-I_S$		--	--	50	A

Note :
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. The data tested by pulsed , pulse width≤ 300us , duty cycle ≤ 2%

Test Circuit

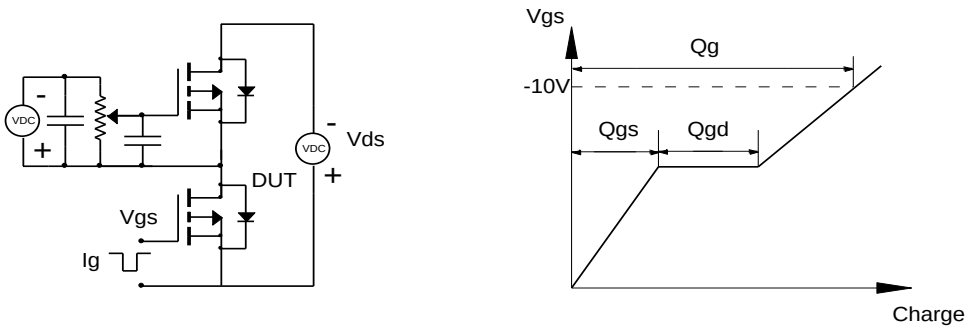


Figure 1: Gate Charge Test Circuit & Waveform

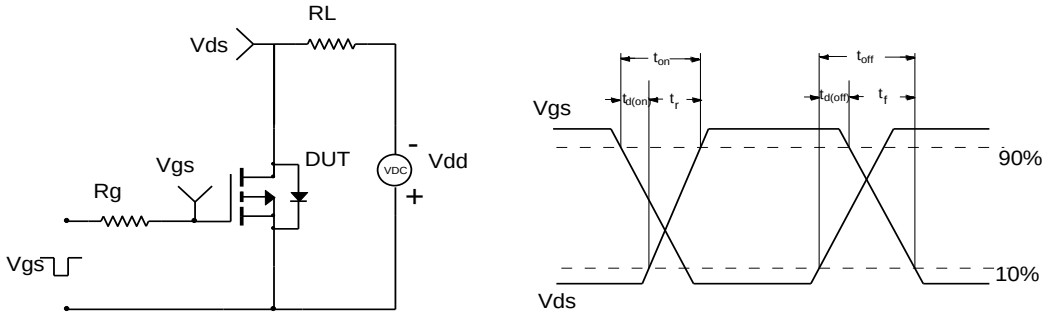


Figure 2: Resistive Switching Test Circuit & Waveform

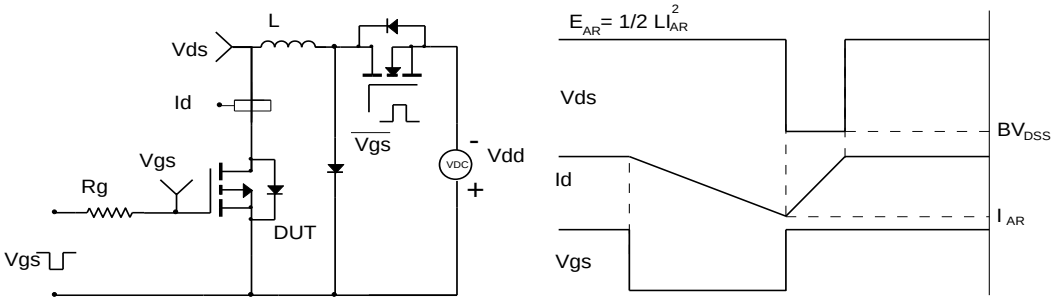


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

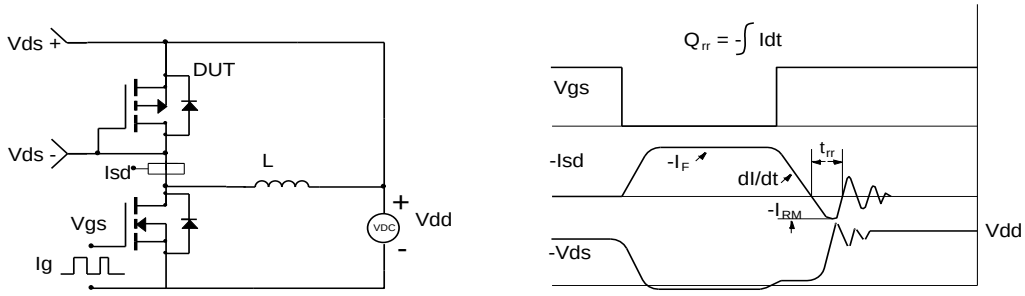
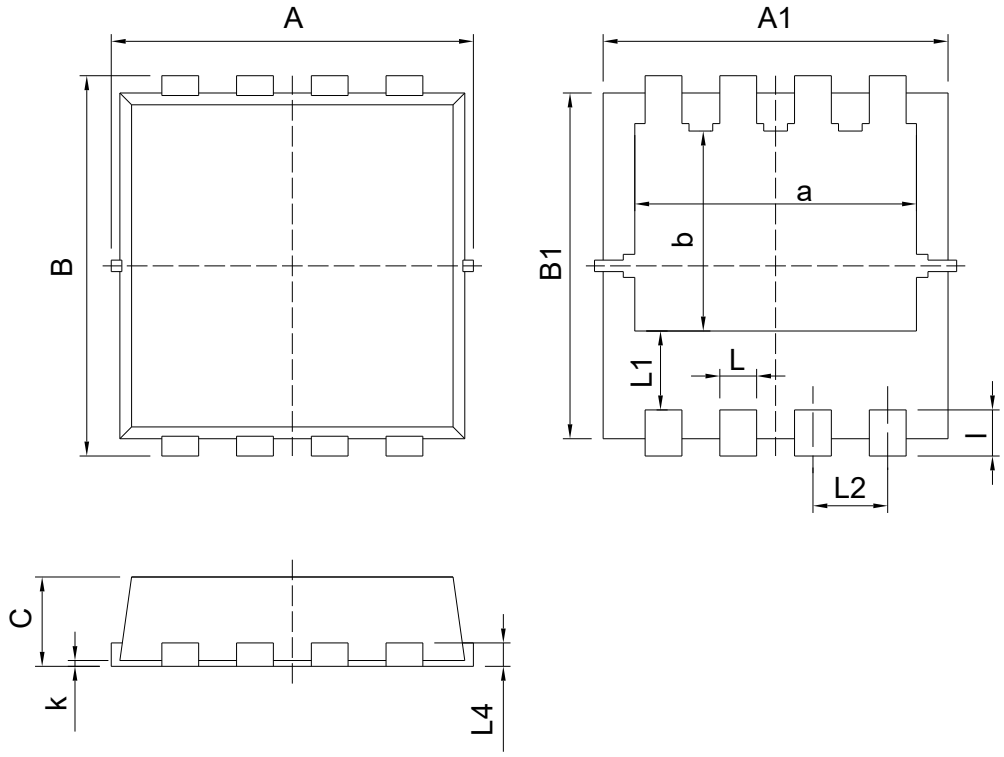


Figure 4: Diode Recovery Test Circuit & Waveform

Package Outline

PDFN3x3-8L

Dimensions in mm



Symbol	Dimensions		Symbol	Dimensions	
	Min.	Max.		Min.	Max.
A	3.2	3.4	L2	0.55	0.75
A1	3.1	3.2	L4	0.14	0.20
B	3.2	3.4	a	2.35	2.55
B1	2.95	3.05	b	1.635	1.835
C	0.75	0.85	k	0.0	0.05
L	0.25	0.35	l	0.3	0.5
L1	-	0.75			

Contact Information

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

For additional information, please contact your local Sales Representative.

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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