TN30N40TE

N-Channel Enhancement Mode Power MOSFET

Product Summary

- V_{DS}= 40V,I_D= 30A
- $R_{DS(on)}$< 17mΩ @V_{GS}= 10V
- $R_{DS(on)}$< 25mΩ @V_{GS}= 4.5V

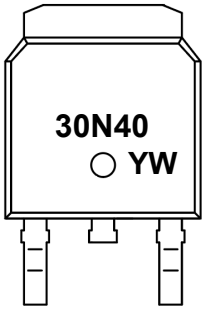
Features

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

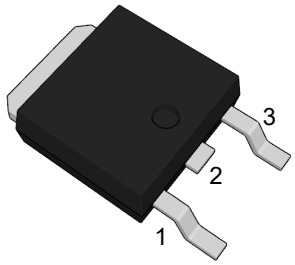
Application

- Load Switch
- PWM Application
- Power management

Marking Code



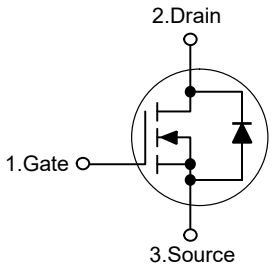
TO-252



(Top View)

Pin	Description
1	Gate
2	Drain
3	Source

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ 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	30	A
Drain Current-Pulsed Note1	I_{DM}	80	A
Single Pulse Avalanche Energy Note2	E_{AS}	31.3	mJ
Maximum Power Dissipation	P_D	31.3	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	4	°C/W

Electrical Characteristics

(T_J=25℃ unless otherwise specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
$V_{(BR)DSS}$	Drain-Sourtce Breakdown Voltage	V_{GS}=0V,I_D=250μA	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS}=0V, V_{DS}=32V,T_J = 25℃	---	---	1	μA
		V_{GS}=0V, V_{DS}=32V,T_J = 55℃	---	---	5	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V, V_{DS}=0A	---	---	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{GS}=V_{DS}, I_D=250μA	1	---	2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance[3]	V_{GS}=10V,I_D=15A	---	16	20	mΩ
		V_{GS}=4.5V,I_D=10A	---	23	29	mΩ
G_{FS}	Forward Transconductance	V_{DS} =5V, I_D =15A	---	34	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	2.1	---	Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1MHz	---	1010	---	pF
C_{oss}	Output Capacitance		---	102	---	
C_{rss}	Reverse Transfer Capacitance		---	70	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=20V,I_D=15A, R_G =3.3Ω, V_{GS}=10V	---	2.8	---	ns
t_r	Rise Time		---	12.8	---	ns
$t_{d(off)}$	Turn-Off Delay Time	V_{DD}=20V,I_D=15A, R_G =3.3Ω, V_{GS}=10V	---	21.2	---	ns
t_f	Fall Time		---	6.4	---	ns
Q_g	Total Gate Charge	V_{DS}=32V, V_{GS}=4.5V, I_D=15A	---	10	---	nC
Q_{gs}	Gate-Source Charge		---	2.55	---	nC
Q_{gd}	Gate-Drain Charge		---	4.8	---	nC

Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	I_S=1A, V_{GS}=0V,T_J = 25℃	---	---	1.2	V
I_S	Continuous Source Current	V_G=V_D=0V	---	---	30	A
I_{SM}	Pulsed Source Current		---	---	80	A
T_{rr}	Reverse Recovery Time	I_F= 15 A,dIF / dt = 100 A/ μ s T_J = 25℃	---	10	---	ns
Q_{rr}	Reverse Recovery Charge		---	3.1	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : TJ=25℃,VDD=20V,V_G=10V,L=0.5mH
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics: (T_J=25℃ unless otherwise noted)

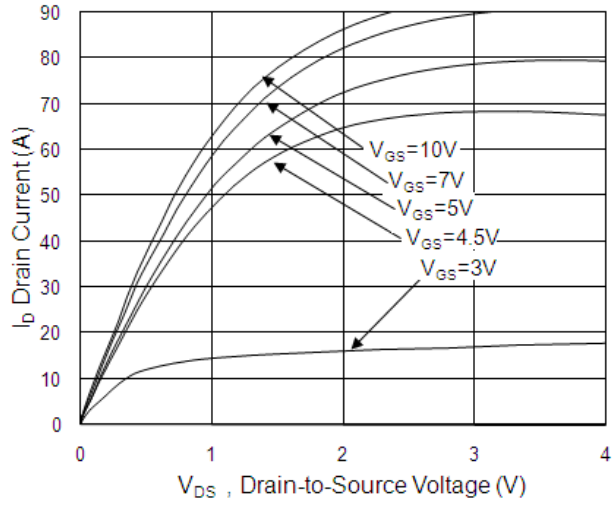


Fig.1 Typical Output Characteristics

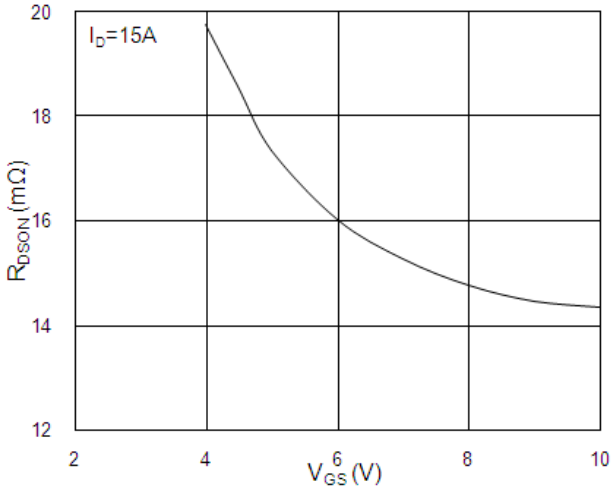


Fig.2 On-Resistance vs. G-S Voltage

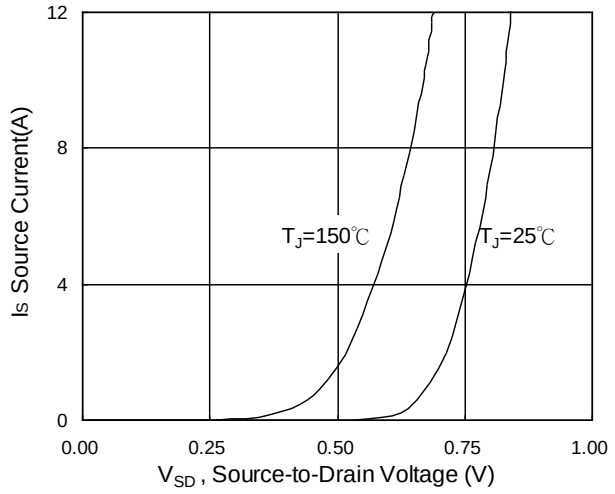


Fig.3 Forward Characteristics Of Reverse

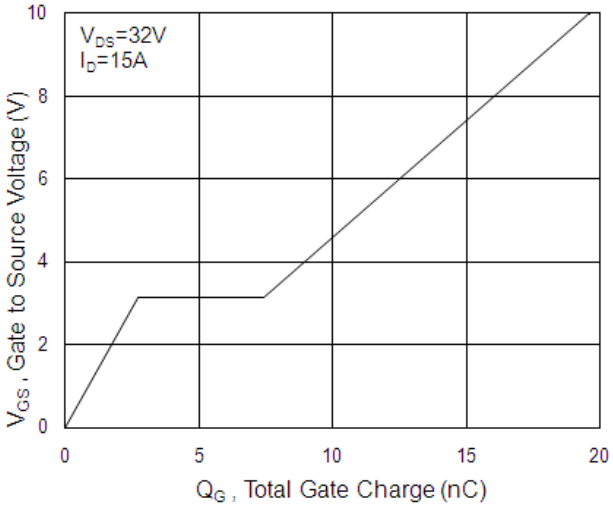


Fig.4 Gate-Charge Characteristics

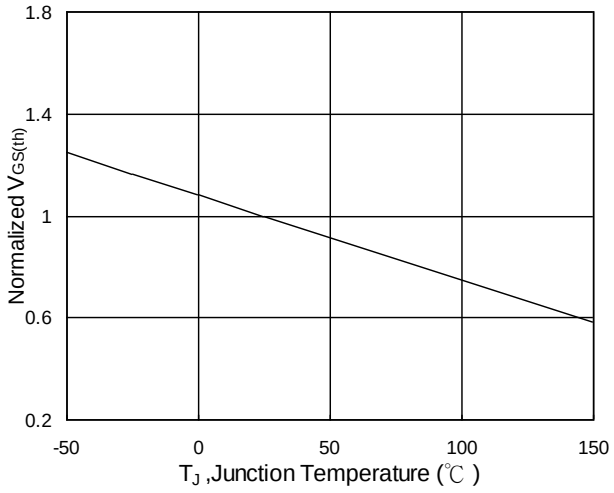


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

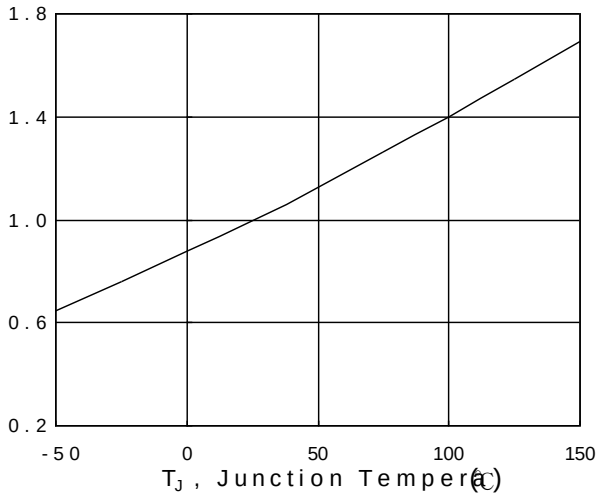


Fig.6 Normalized R_{DSON} vs. T_J

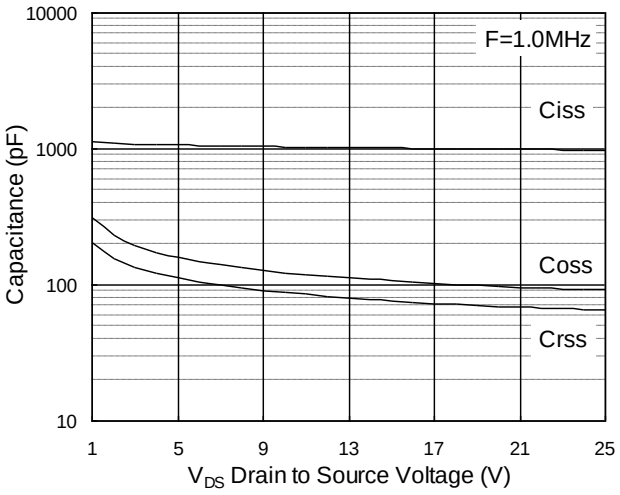


Fig.7 Capacitance

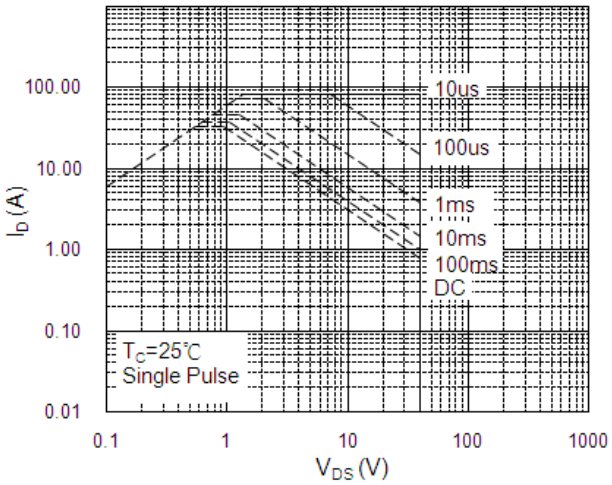


Fig.8 Safe Operating Area

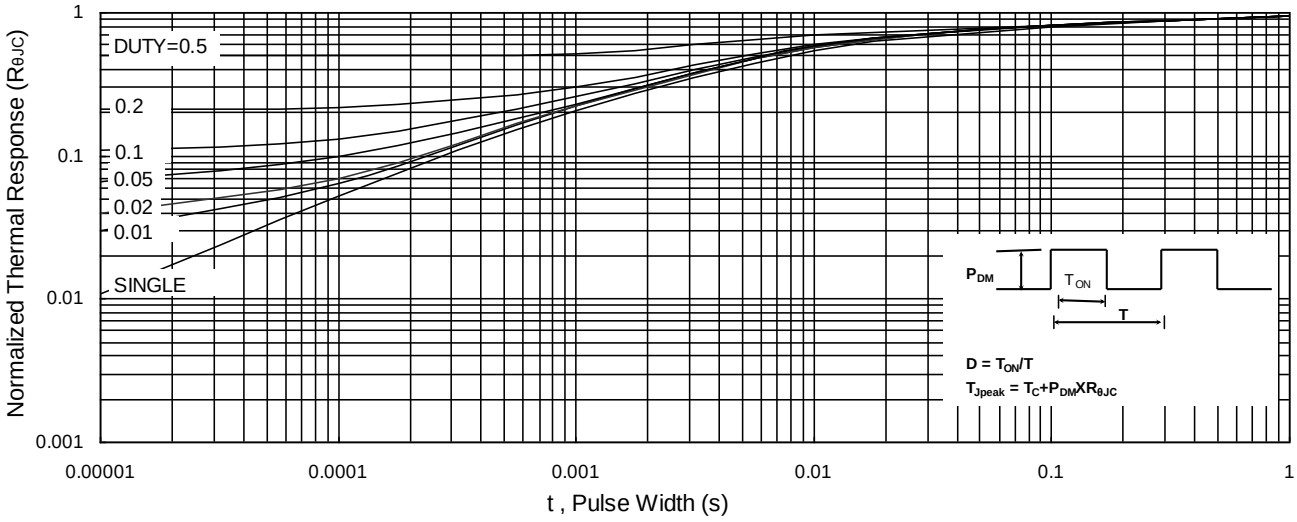
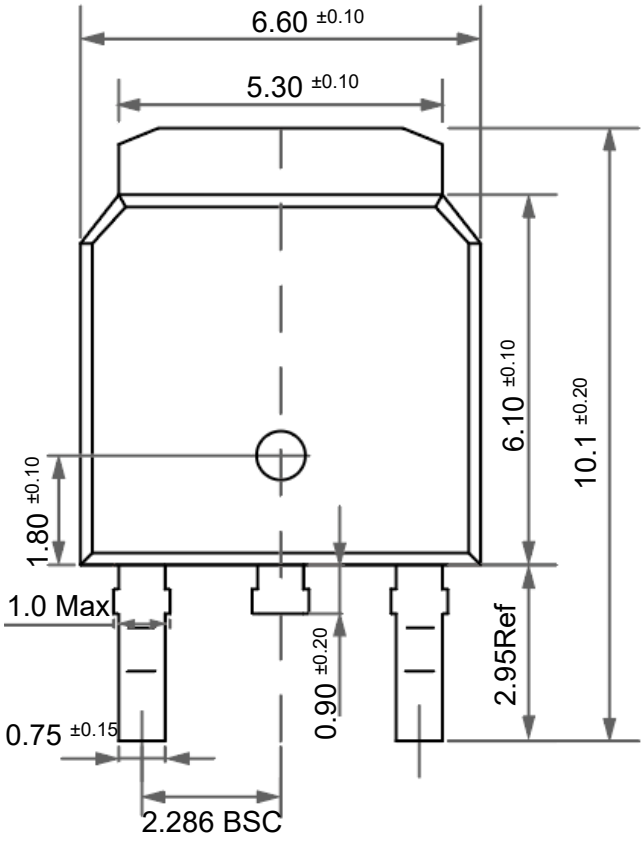


Fig.9 Normalized Maximum Transient Thermal Impedance

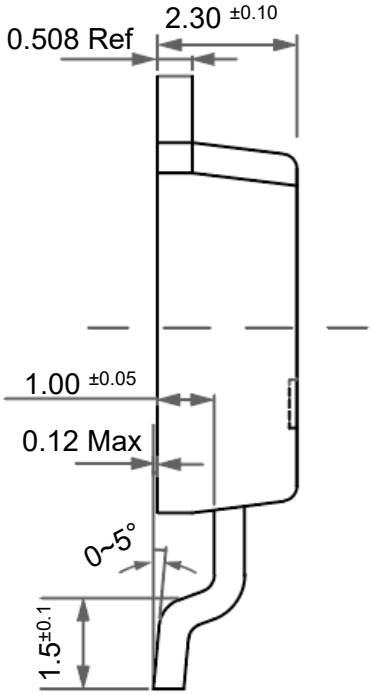
Package Outline

TO-252

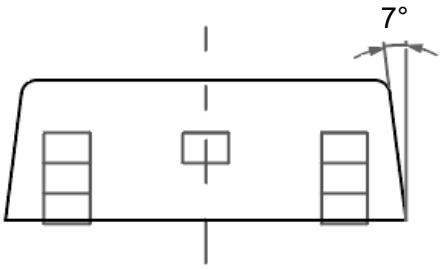
Dimensions in mm



Front View



Side View



Bottom View

Ordering Information

Device	Package	Shipping
TN30N40TE	TO-252	2,500PCS/Reel&13inches

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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