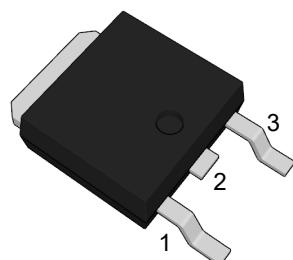


Product Summary

- $V_{DS} = 40V, I_D = 55A$
- $R_{DS(on)} < 9.8m\Omega$ @ $V_{GS} = 10V$
- $R_{DS(on)} < 12.5m\Omega$ @ $V_{GS} = 4.5V$

TO-252



(Top View)

Features

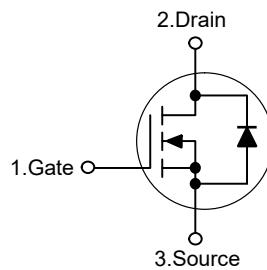
- Advanced Trench Technology
- 100% Avalanche Tested
- RoHS Compliant
- Halogen and Antimony Free
- Moisture Sensitivity Level 3

Application

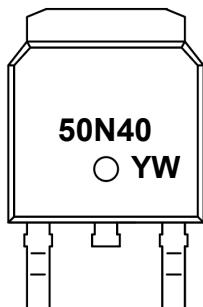
- Load Switch
- PWM Application
- Power management

Pin	Description
1	Gate
2	Drain
3	Source

Schematic Diagram



Marking Code



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}	± 20	V
Drain Current-Continuous	I_D	55	A
Drain Current-Pulsed ^{Note1}	I_{DM}	220	A
Single Pulse Avalanche Energy ^{Note2}	E_{AS}	51	mJ
Maximum Power Dissipation	P_D	50	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Case	R_{eJC}	2.5	°C/W
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Electrical Characteristics

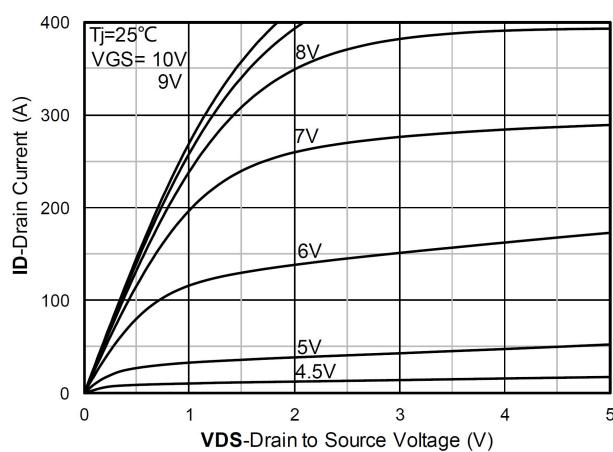
(T_J=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V , ID=250uA	40	-	-	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =32V , V _{GS} =0V , T _J =25°C	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±20V , V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} =V _{DS} , ID =250uA	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V , ID=12A	-	8	12	mΩ
		V _{GS} =4.5V , ID=6A	-	11	18	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V , V _{GS} =0V , f=1MHz	-	1785	-	pF
Output Capacitance	C _{oss}		-	210	-	
Reverse Transfer Capacitance	C _{rss}		-	158	-	
Total Gate Charge	Q _g	V _{DS} =20V , V _{GS} =10V , ID=10A	-	31	-	nC
Gate-Source Charge	Q _{gs}		-	4	-	
Gate-Drain Charge	Q _{gd}		-	11	-	
Switching Characteristics						
Turn-On Delay Time	T _{d(on)}	V _{DD} =20V , V _{GS} =10V , RG=3Ω, ID=10A	-	6	-	nS
Rise Time	T _r		-	16	-	
Turn-Off Delay Time	T _{d(off)}		-	31	-	
Fall Time	T _f		-	15	-	
Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V , I _S =1A , T _J =25°C	-	-	1.2	V
Maximum Body-Diode Continuous Current	I _S		-	-	55	A
Reverse Recovery Time	T _{rr}	I _S =10A, di/dt=100A/us, T _J =25°C	-	31	-	nS
Reverse Recovery Charge	Q _{rr}		-	23	-	nC

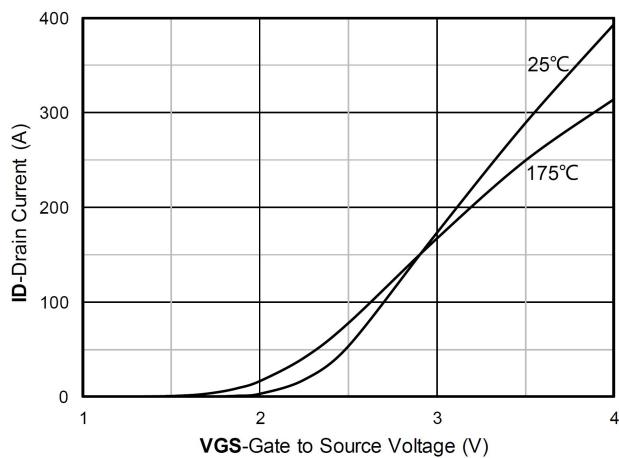
Note :

1. The EAS test condition is V_{DD}=20V, V_{GS}=10V, L=0.1mH, RG=25Ω

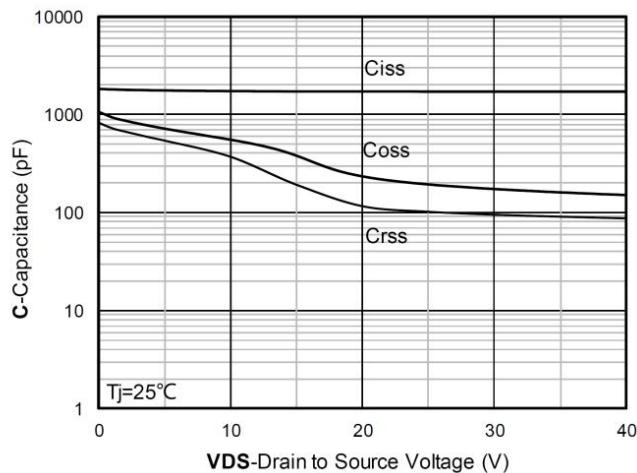
Typical Characteristic Curves



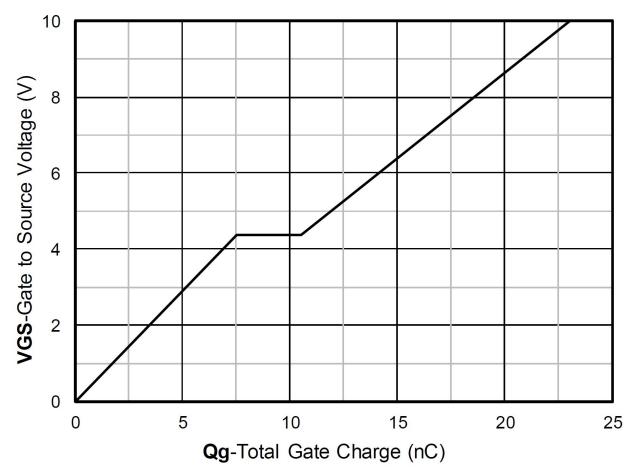
Output Characteristics



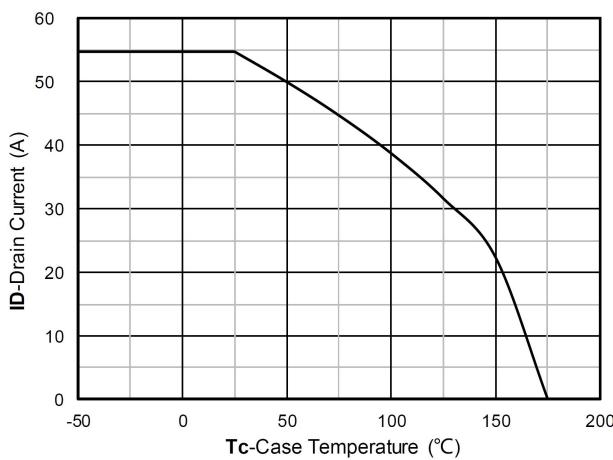
Transfer Characteristics



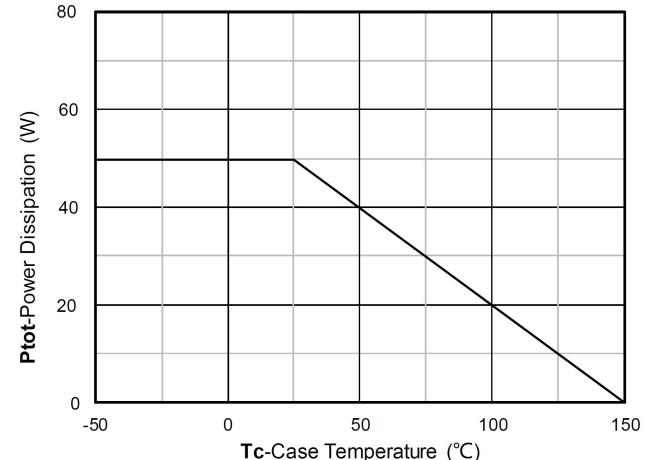
Capacitance Characteristics



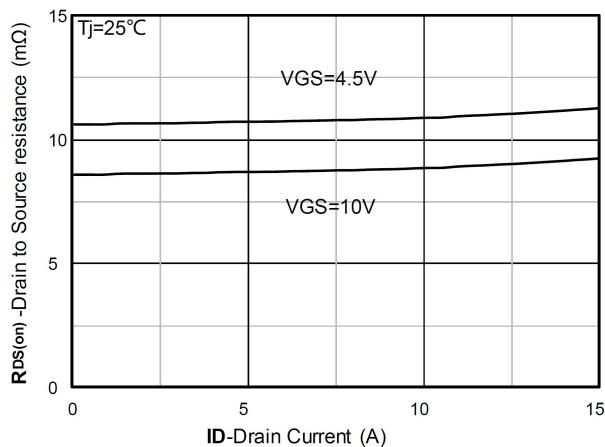
Gate Charge



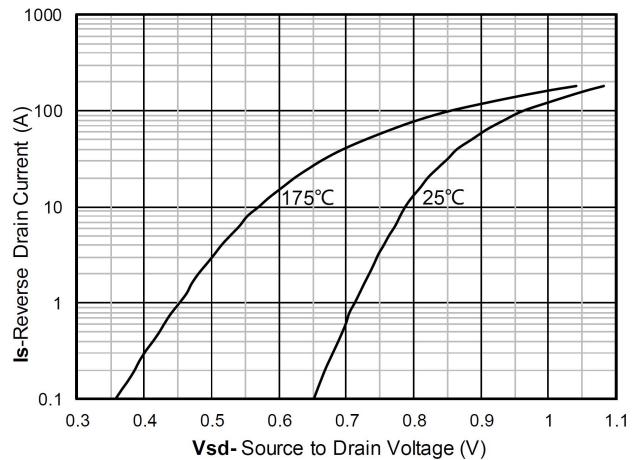
Current dissipation



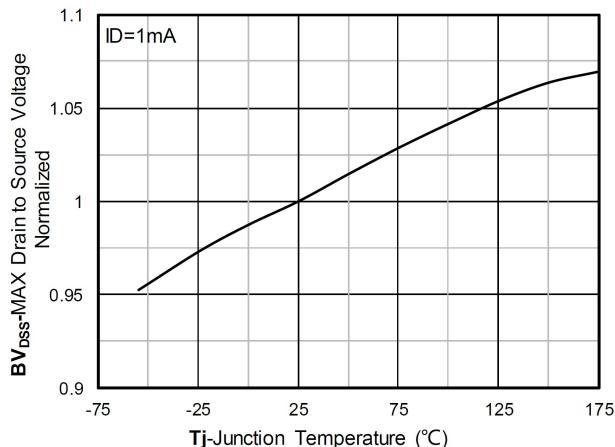
Power dissipation



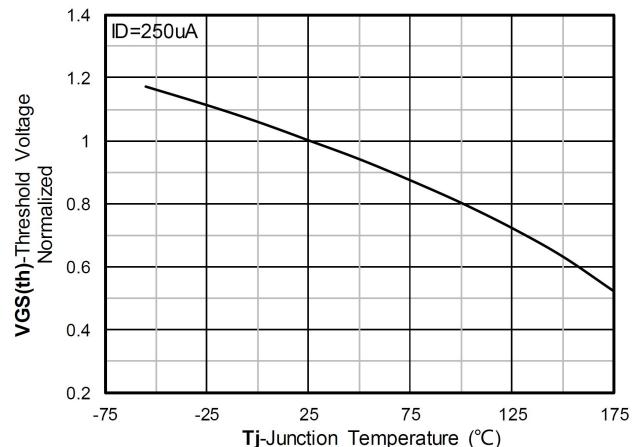
RDS(on) VS Drain Current



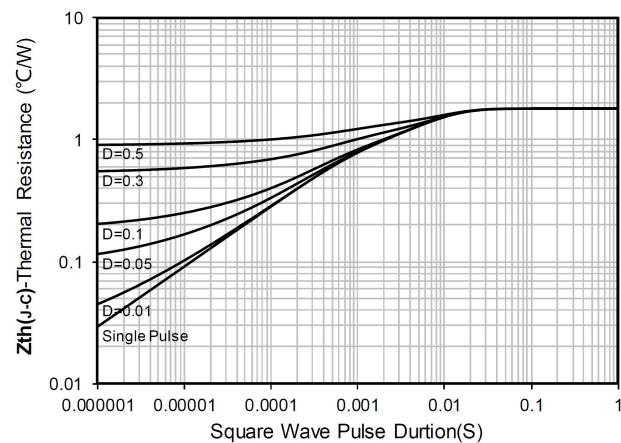
Forward characteristics of reverse diode



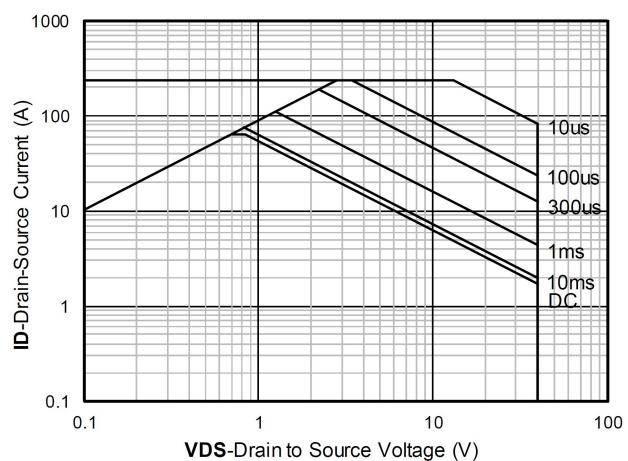
Normalized breakdown voltage



Normalized Threshold voltage



Maximum Transient Thermal Impedance

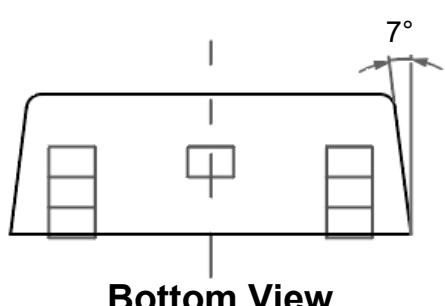
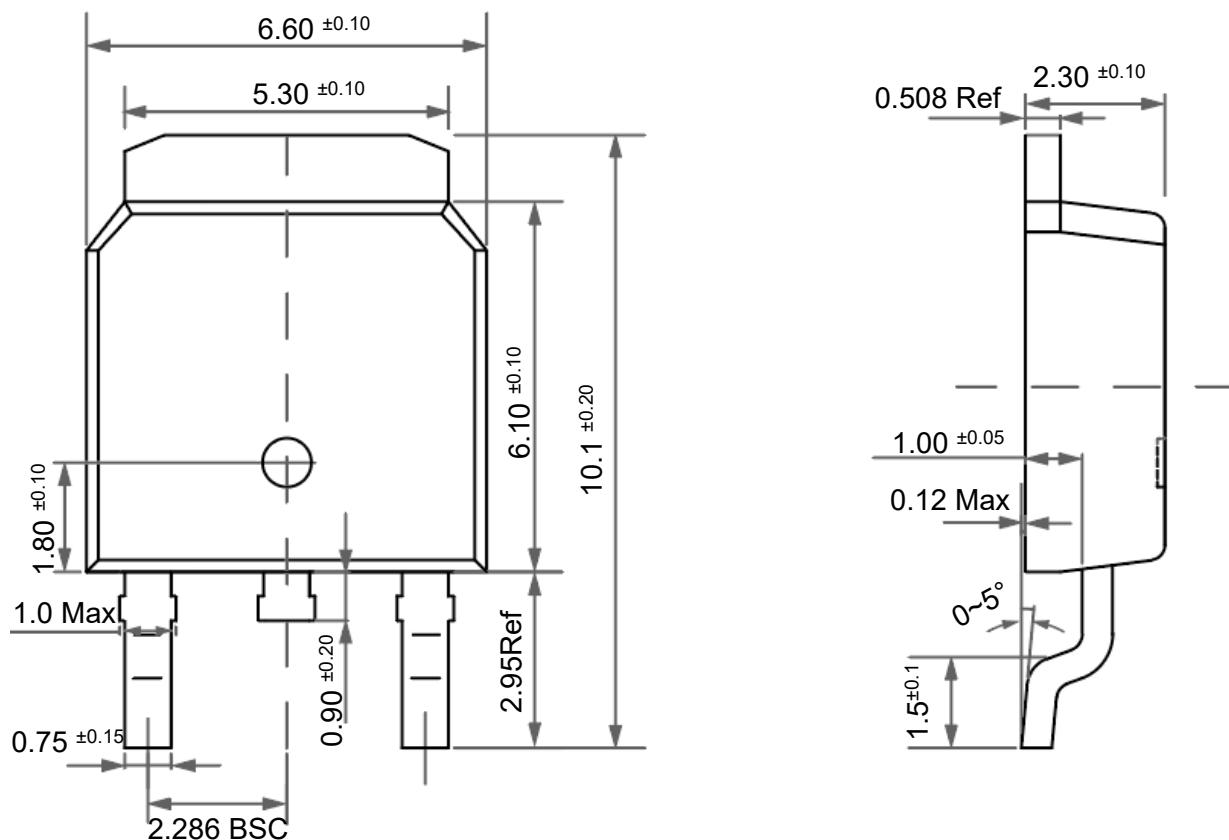


Safe Operation Area

Package Outline

TO-252

Dimensions in mm



Ordering Information

Device	Package	Shipping
TN50N40TE	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.



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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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The design of the product is intended to meet civilian needs and is not guaranteed for use in harsh environments or precision equipment. It is not recommended for use in systems or equipment such as medical devices, aircraft, nuclear power, and similar systems, where failures in these systems or equipment could reasonably be expected to result in personal injury. TANI shall assume no responsibility for any consequences resulting from such usage.

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