UMW NTR4502PT1G

-30V P-Channel MOSFET

1.Description

The UMW NTR4502PT1G uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use as a load switch or in PWM applications.

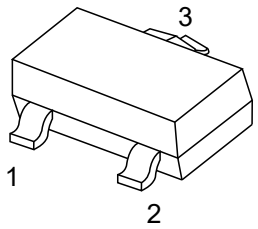
2.1Features

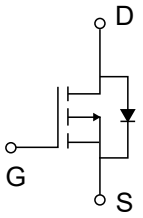
- $V_{(BR)DSS}$=-30V
- I_D=-3A
- $R_{DS(ON)}$<60mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<100mΩ(V_{GS}=-4.5V)

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	S	SOURCE
3	D	DRAIN

SOT-23





4.Maximum ratings (T_A=25°C unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	-3	A
Drain Current-Pulsed	I_{DM}	-24	A
Power Dissipation	P_D	300	mW
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~+150	°C

5.Electrical Characteristics T_A=25°C

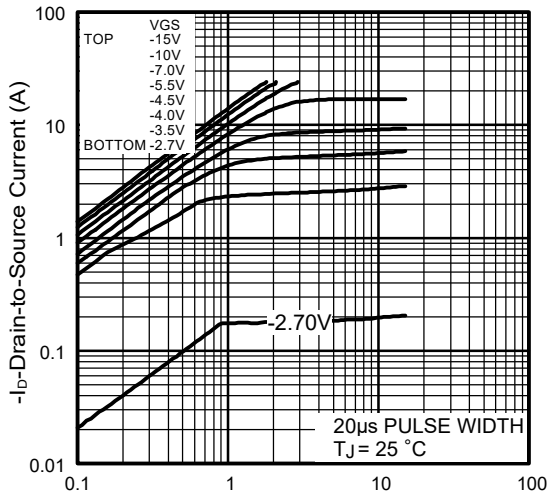
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=-250μA	-30			V
Zero gate voltage drain current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	μA
Gate -source leakage current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Drain-source on-resistance (note 1)	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-4.1A			85	mΩ
		V_{GS}=-4.5V, I_D=-3A			145	mΩ
Forward tranconductance (note 1)	g_{FS}	V_{DS}=-5V, I_D=-4A	5.5			S
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-1		-3	V
Diode forward voltage (note 1)	V_{SD}	I_S=-1A, V_{GS}=0V			-1	V
Dynamic characteristics (note 2)						
Input Capacitance	C_{iss}	V_{DS}=-15V, V_{GS}=0V, f=1MHz		700		pF
Output Capacitance	C_{oss}			120		pF
Reverse Transfer Capacitance	C_{rss}			75		pF
Switching characteristics (note 2)						
Turn-On delay time	$t_{D(on)}$	V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω,R_{GEN}=3Ω		8.6		ns
Turn-On rise time	t_r			5		ns
Turn-Off delay time	$t_{D(off)}$			28.2		ns
Turn-Off fall time	t_f			13.5		ns

Notes:

1. Pulse test: Pulse width ≤300μs, Duty cycle ≤2%.

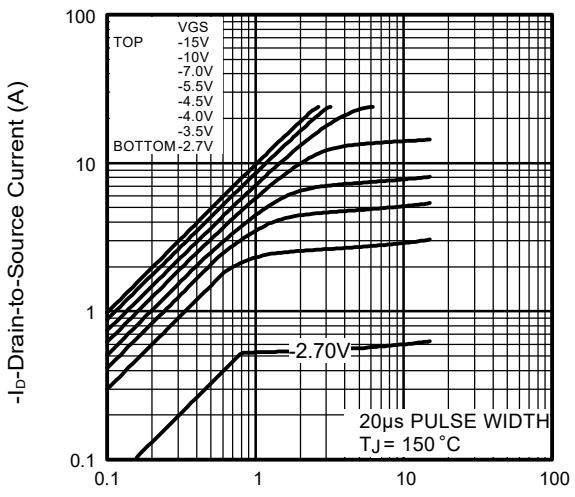
2. These parameter have no way to verify.

6.1Typical Characterisitics



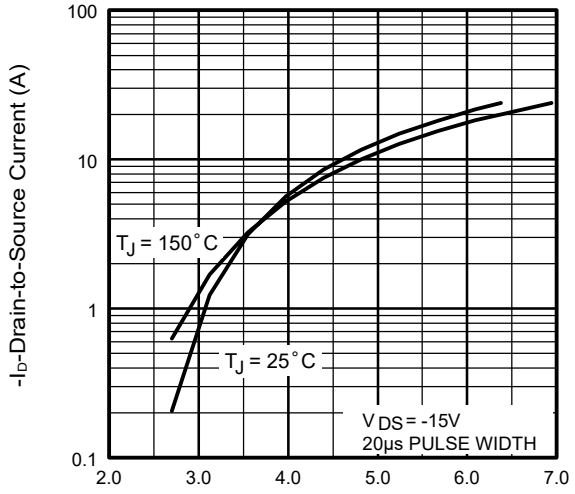
-V_{DS} - Drain-to-Source Voltage (V)

Fig 1. Typical Output Characteristics



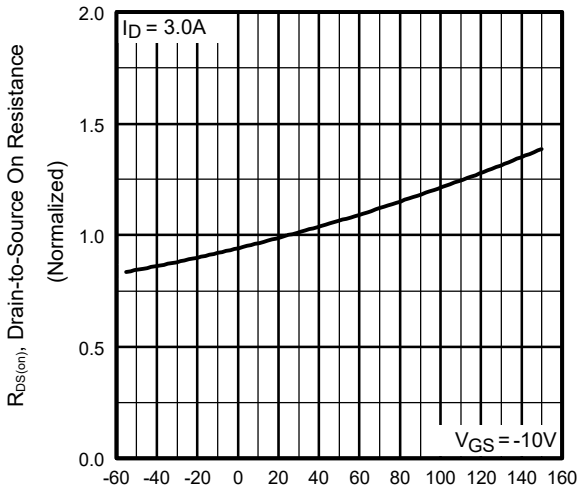
-V_{DS} - Drain-to-Source Voltage (V)

Fig 2. Typical Output Characteristics



-V_{GS}, Gate-to-Source Voltage (V)

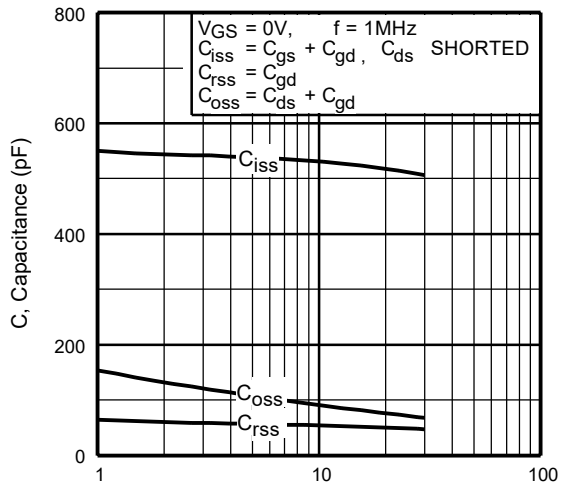
Fig 3. Typical Transfer Characteristics



T_J, Junction Temperature (°C)

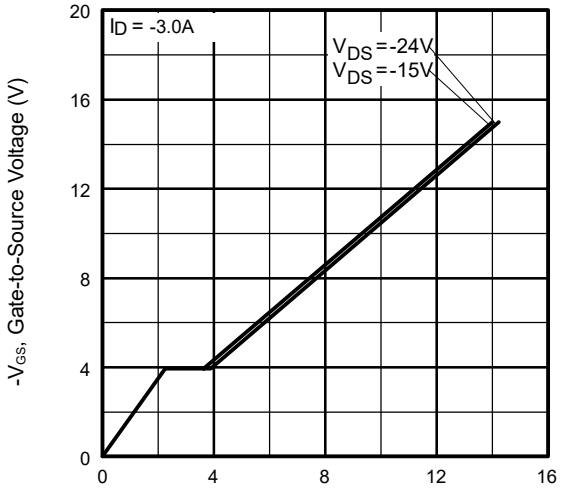
Fig 4. Nomalized On-ResistanceVs. Temperature

6.2Typical Characterisitics



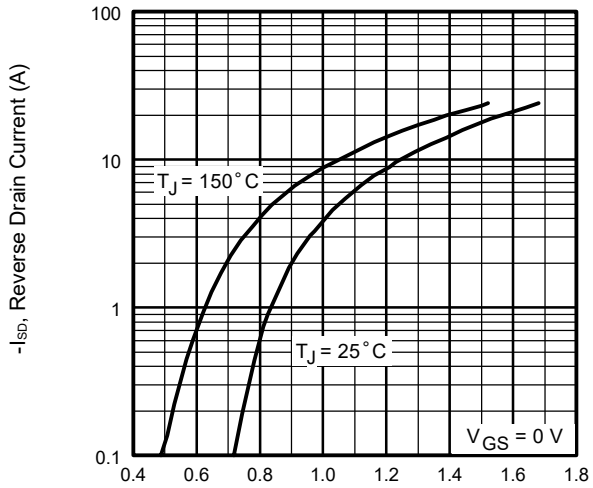
-V_{DS} ,Drain-to-Source Voltage (V)

Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage



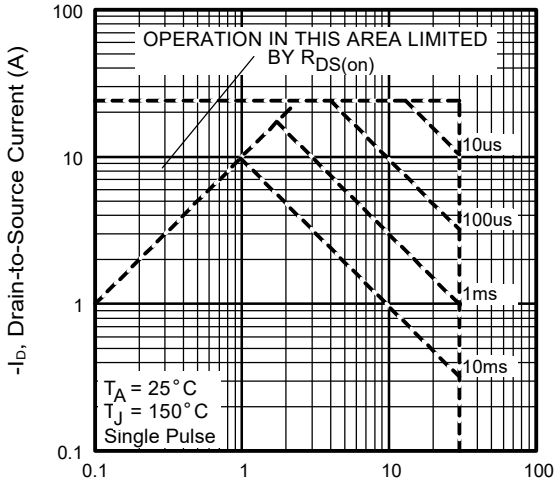
Q_G, Total Gate Charge (nC)

Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage



-V_{SD}, Source-to-Drain Voltage (V)

Fig 7. Typical Source-Drain Diode Forward Voltage



-V_{DS}, Drain-to-Source Voltage (V)

Fig 8. Maximum Safe Operating Area

6.3Typical Characterisitics

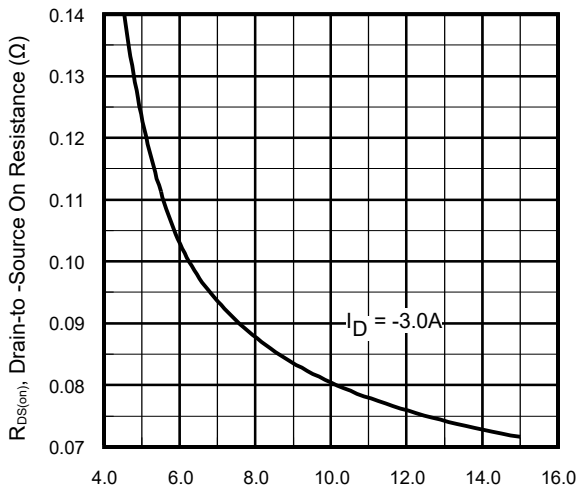


Fig 9. Typical On-Resistance vs. Gate Voltage

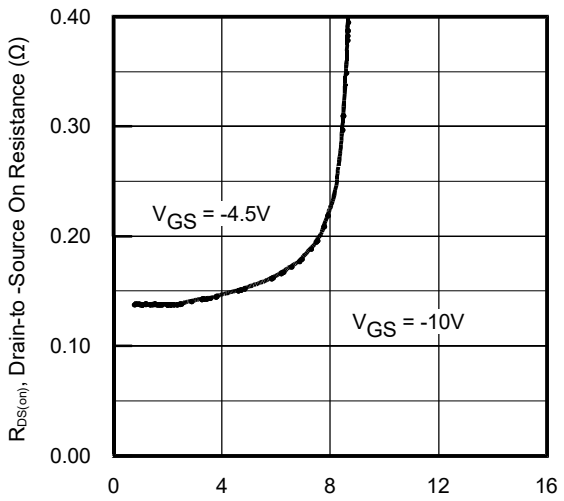


Fig 10. Typical On-Resistance vs. Drain Current

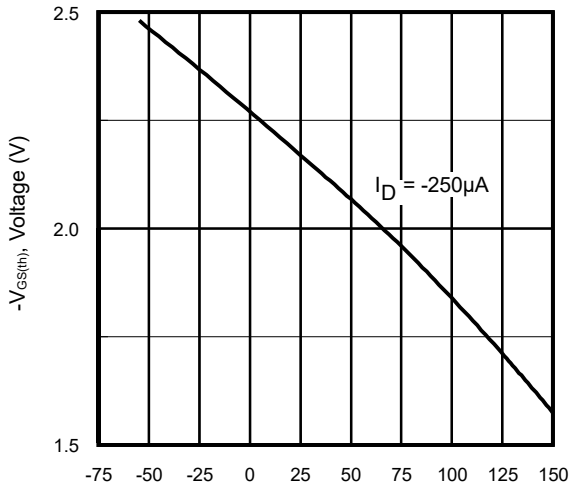


Fig 11. Typical Threshold Voltage vs. Temperature

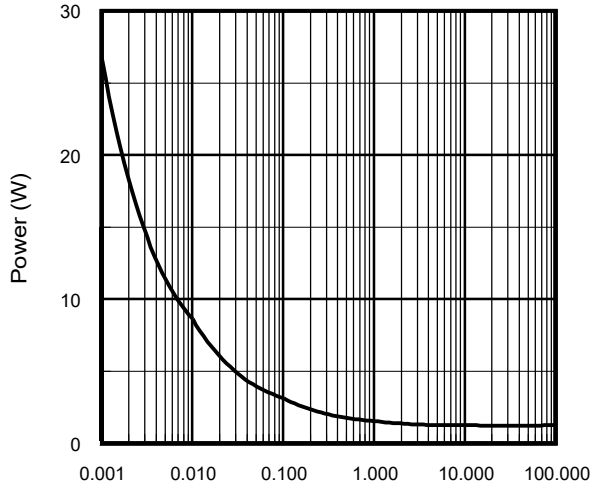


Fig 12. Typical Power vs. Time

6.4Typical Characterisitics

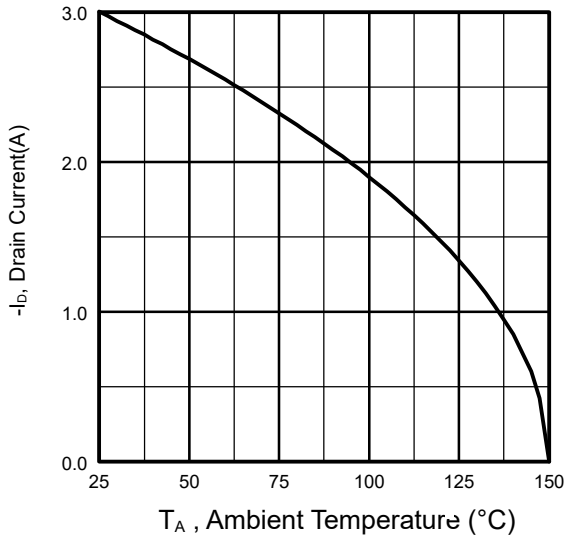


Fig 13. Maximum Drain Current vs. Ambient Temperature

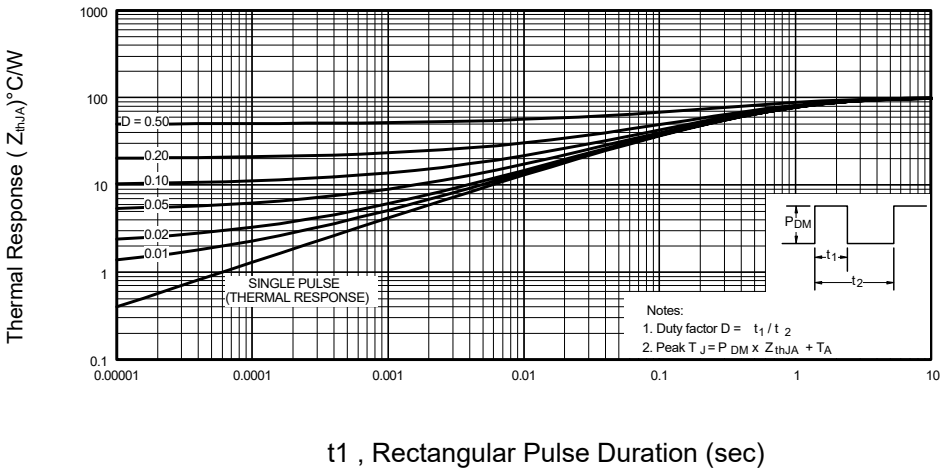


Fig 14. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

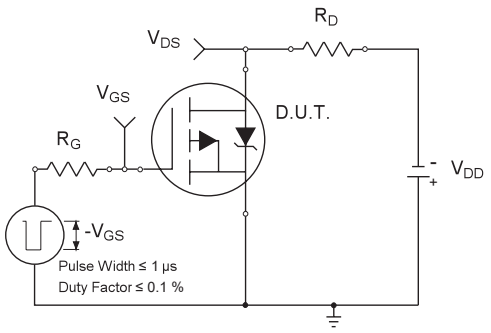


Fig 15a. Switching Time Test Circuit

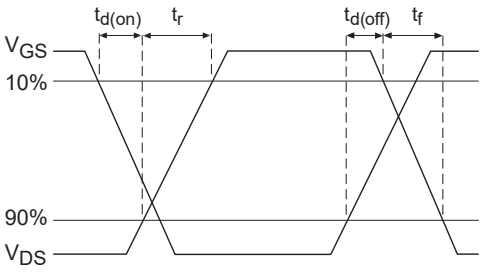


Fig 15b. Switching Time Waveforms

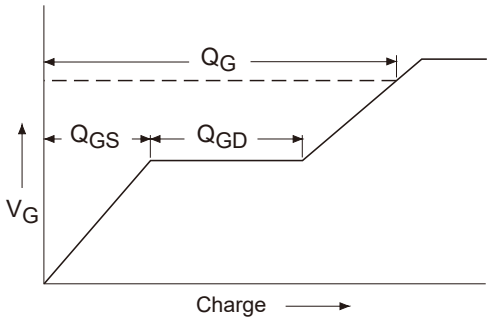


Fig 16a. Basic Gate Charge Waveform

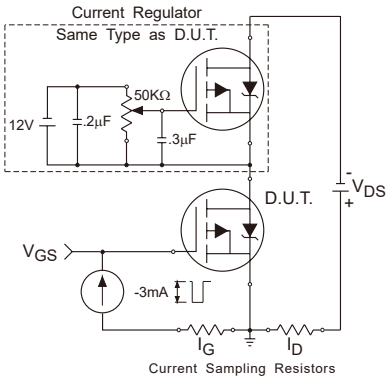
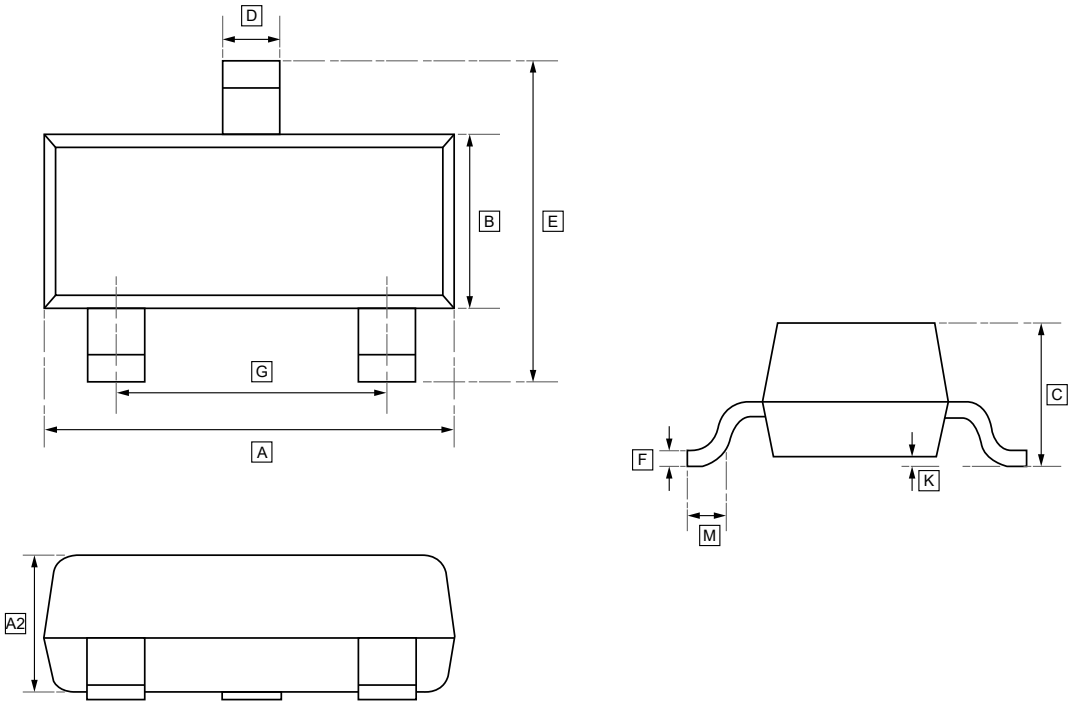


Fig 16b. Gate Charge Test Circuit

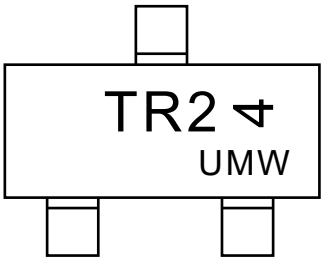
7.SOT-23 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	B	C	D	E	G	K	M	A2	F
Min	2.80	1.20	0.90	0.32	2.25	1.80	0.00	0.30	0.95	0.095
Max	3.04	1.40	1.10	0.55	2.55	2.00	0.10	-	1.05	0.115

8.Ordering information



Order Code	Package	Base QTY	Delivery Mode
UMW NTR4502PT1G	SOT-23	3000	Tape and reel

9.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.