UMW IRLML5203TR

-30V P-Channel MOSFET

1.Description

The IRLML5203TR uses advanced trench technology to provide excellent $R_{DS(on)}$ with low gate charge. This device is suitable for use as a loadswitch or in PWM applications.

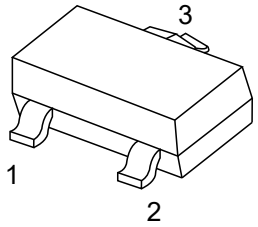
2.1Features

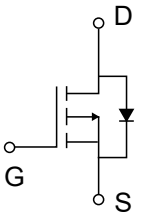
- $V_{DS\ (V)}$=-30V
- I_D=-3A
- $R_{DS(ON)}$<60mΩ(V_{GS}=-10V)
- $R_{DS(ON)}$<100mΩ(V_{GS}=-4.5V)

4.Pinning information

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

SOT-23





5.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	1.2	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	100	°C/W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55~+150	°C

7.Electrical Characteristics T_A=25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	I_D=-250μA, V_{GS}=0V	-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=-3A			60	mΩ
		V_{GS}=-4.5V, I_D=-2.6A			100	mΩ
Forward tranconductance (note 1)	g_{fs}	V_{DS}=-5V, I_D=-3A	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_{GS}=0V, V_{DS}=-15V, 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.

8.1Typical Characterisitics

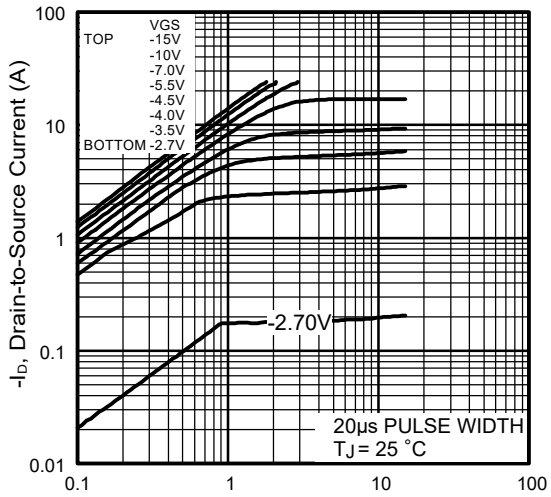


Fig 1. Typical Output Characteristics

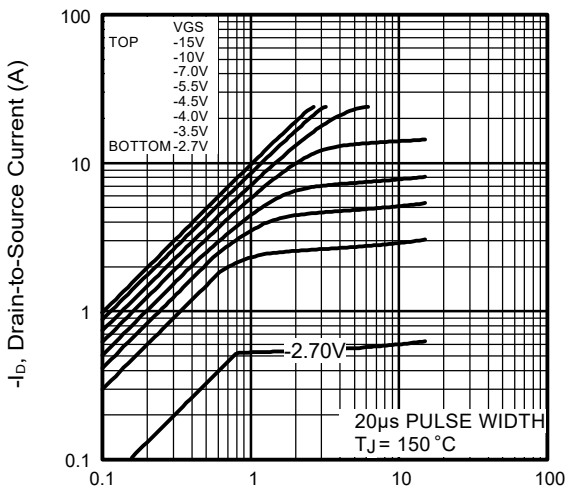


Fig 2. Typical Output Characteristics

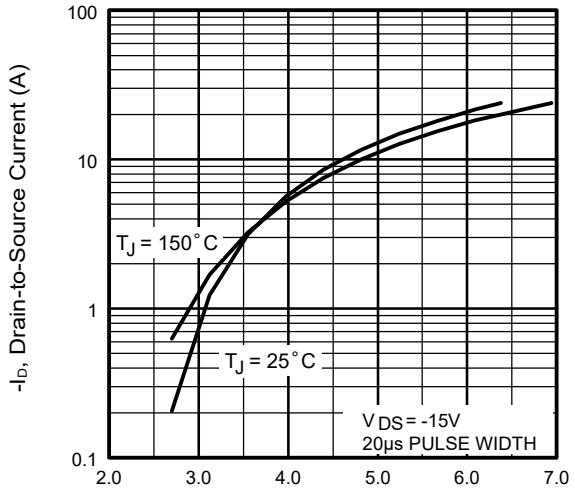


Fig 3. Typical Transfer Characteristics

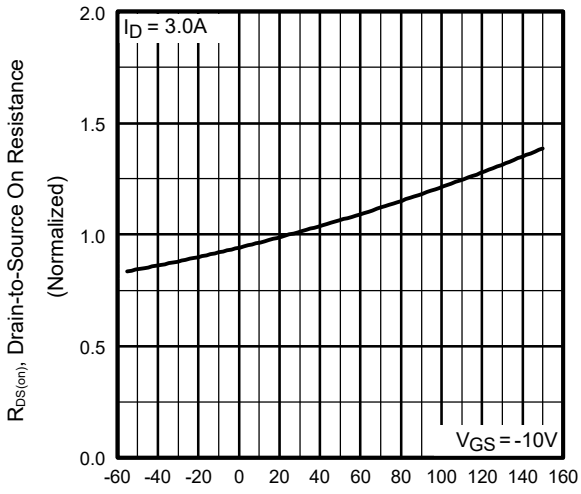
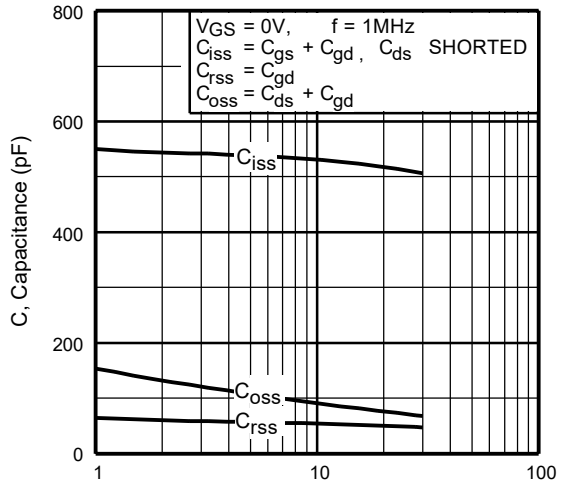


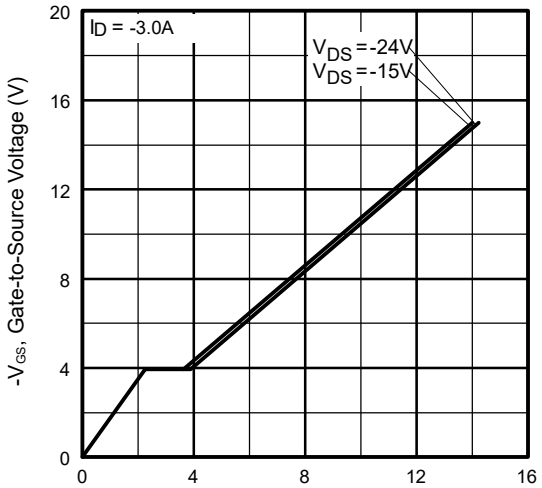
Fig 4. Nomalized On-ResistanceVs. Temperature

8.2Typical Characterisitics



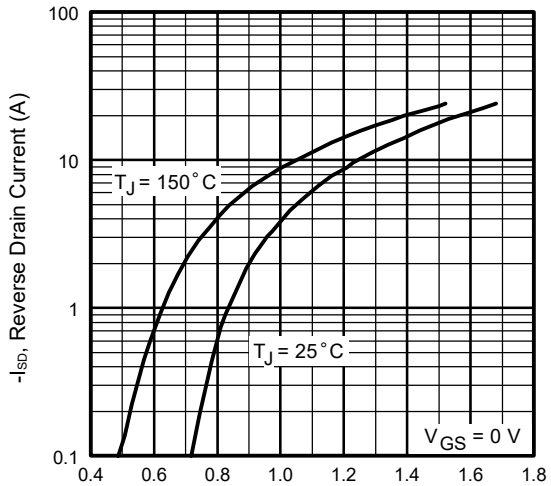
$-V_{DS}$,Drain-to-Source Voltage (V)

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



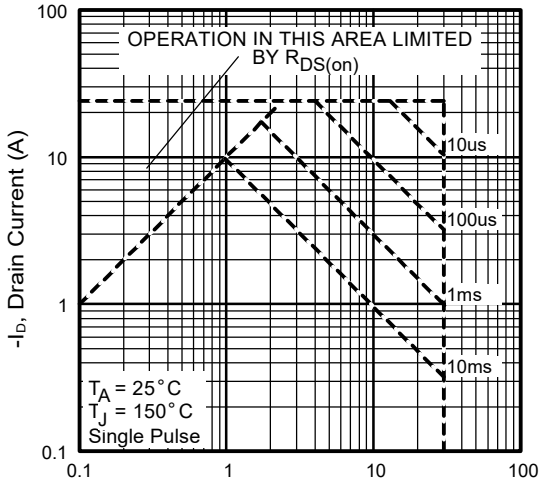
Q_G, Total Gate Charge (nC)

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

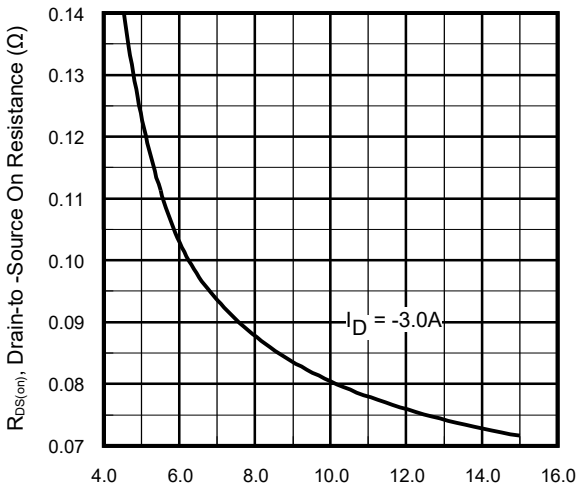


Fig 9. Typical On-Resistance vs. Gate Voltage

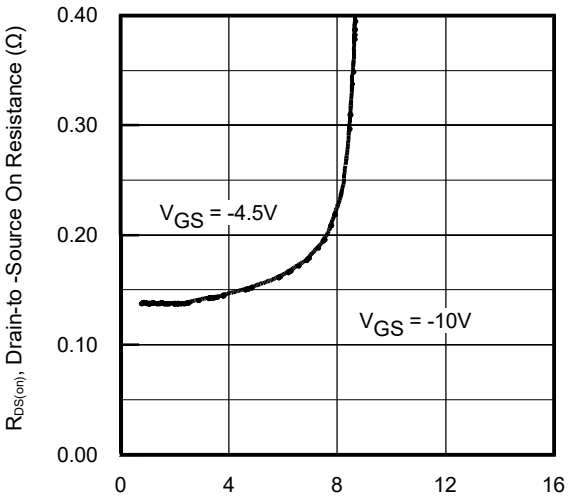


Fig 10. Typical On-Resistance vs. Drain Current

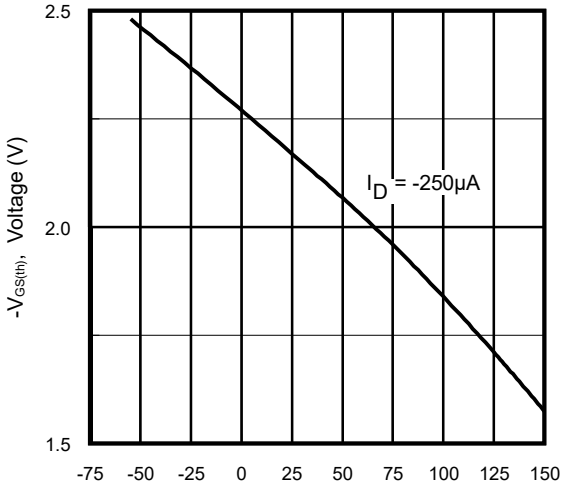


Fig 11. Typical Threshold Voltage vs. Junction Temperature

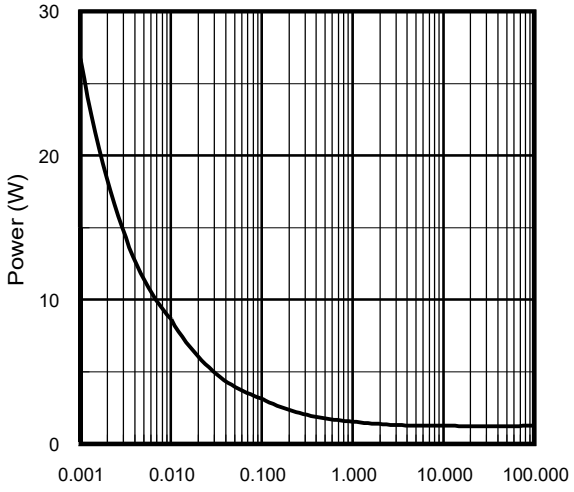


Fig 12. Typical Power vs. Time

8.3Typical Characterisitics

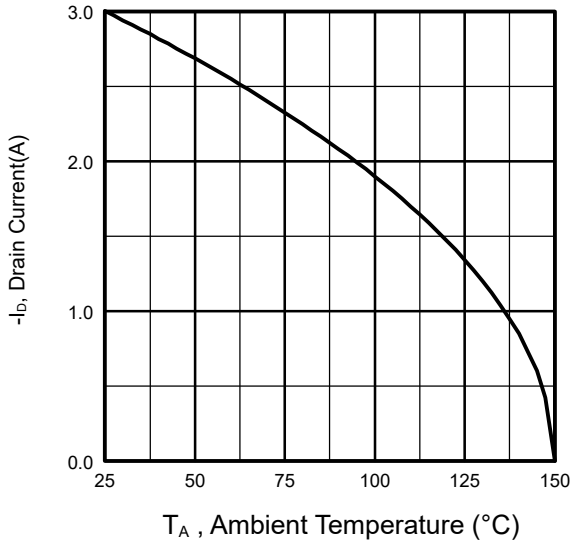


Fig 13. Maximum Drain Current vs. Ambient Temperature

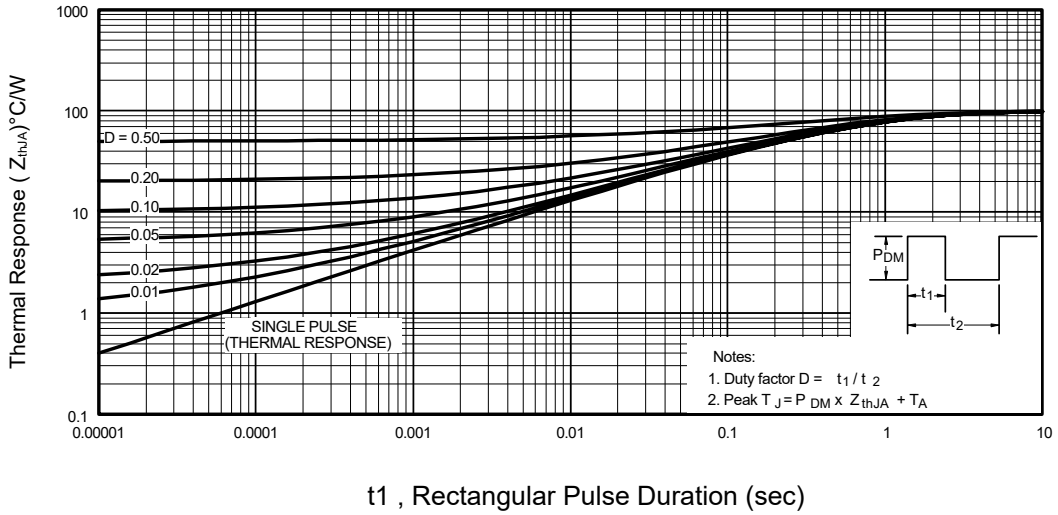


Fig 14. Typical Effective Transient Thermal Impedance, Junction-to-Ambient

8.4Typical Characterisitics

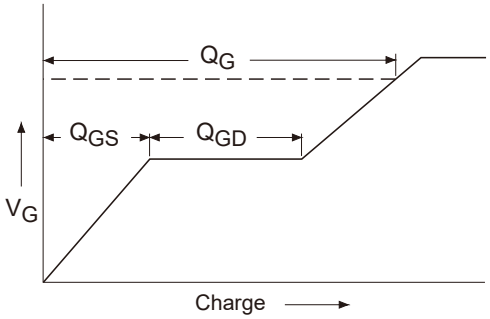


Fig 15a. Basic Gate Charge Wavefomm

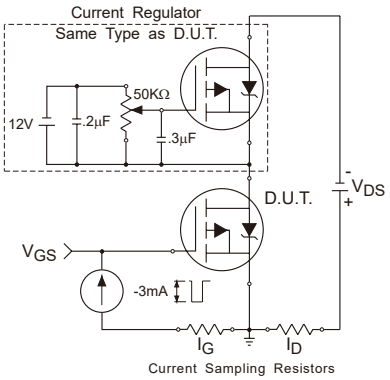


Fig 15a. Switching Time Test Circuit

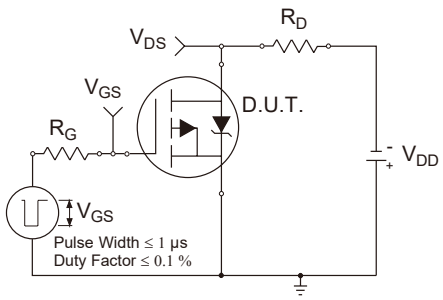


Fig 16a. Gate Charge Test Circuit

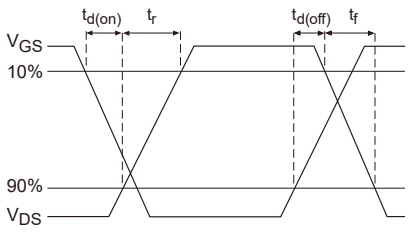
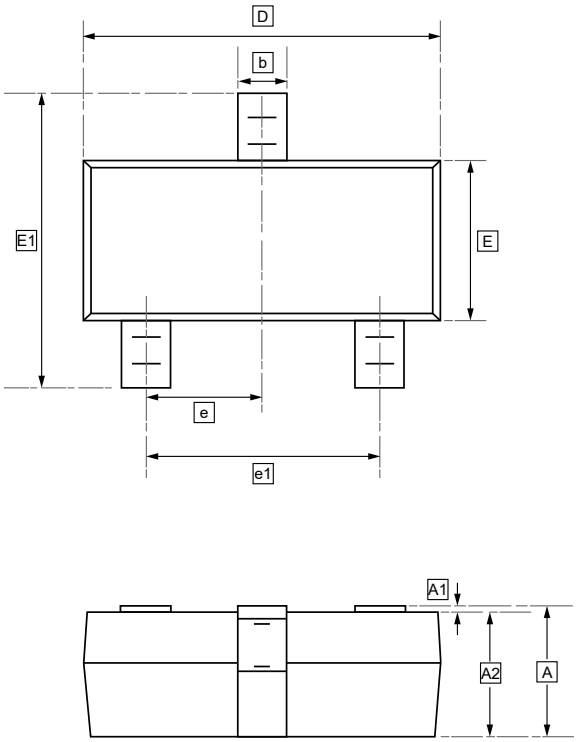


Fig 16b. Switching Time Wavefomms

9.SOT-23 Package Outline Dimensions

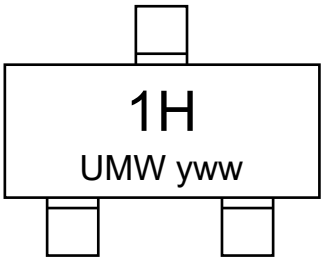


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	b	C	D	E	E1	e	e1	L	L1
Min	0.90	0.00	0.90	0.30	0.08	2.80	1.20	2.25	0.95	1.80	0.55	0.30
Max	1.15	0.10	1.05	0.50	0.15	3.00	1.40	2.55	TYP.	2.00	REF	0.50

Symbol	F	θ	θ1
Min	0.25	0°	2°
Max		8°	12°

10.Ordering information



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRLML5203TR	SOT-23	3000	Tape and reel

11.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.