UMW IRLML6302TR

-20V P-Channel MOSFET

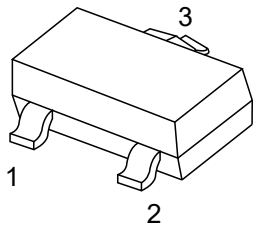
1.Features

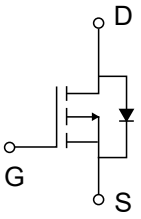
- $V_{DS\ (V)}$=-20V
- $R_{DS(ON)}$<90mΩ(V_{GS}=-4.5V)
- $R_{DS(ON)}$<110mΩ(V_{GS}=-2.7V)
- Lead-Free
- P-Channel MOSFET
- SOT-23 Footprint
- Available in Tape and Reel
- Fast Switching

2.Pinning information

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

SOT-23





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

Parameter		Symbol	Value	Units
Continuous Drain Current, V_{GS} @ -4.5V	T_A=25°C	I_D	-0.78	A
Continuous Drain Current, V_{GS} @ -4.5V	T_A=70°C		-0.62	
Pulsed Drain Current ①		I_{DM}	-4.9	
Power Dissipation	T_A=25°C	P_D	540	mW
Linear Derating Factor			4.3	mW/°C
Gate-to-Source Voltage		V_{GS}	±12	V
Peak diode Recovery dv/dt ②		dv/dt	-5	V/ns
Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 150	°C

4.Thermal resist ance rating

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambien ④	$R_{\theta JA}$		230	°C/W

5.Electrical Characteristics T_J=25°C

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250μA, V_{GS}=0V	-20			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/\Delta T_J$	I_D=-1mA, Reference to 25°C		-4.9		mV/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-0.61A ③			90	mΩ
		V_{GS}=-2.7V, I_D=-0.31A ③			110	
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.7		-1.5	V
Forward Transconductance	g_{fs}	V_{DS}=-10V, I_D=-0.31A	0.56			S
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=-16V,V_{GS}=0V			-1	μA
		V_{DS}=-16V, V_{GS}=0V, T_J=125°C			-25	
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=-12V			-100	nA
Gate-to-Source Reverse Leakage		V_{GS}=12V			100	
Total Gate Charge	Q_g	I_D=-0.61A		2.4	3.6	nC
Gate-to-Source Charge	Q_{gs}	V_{DS}=-16V		0.56	0.84	
Gate-to-Drain ("Miller") Charge	Q_{gd}	V_{GS}=-4.5V,See Fig.6 and 9 ③		1	1.5	
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=-10V		13		ns
Rise Time	t_r	I_D=-0.61A		18		
Turn-Off Delay Time	$t_{D(off)}$	R_G=6.2Ω		22		
Fall Time	t_f	R_D=16Ω, See Fig.10 ③		22		
Input Capacitance	C_{iss}	V_{GS}=0V		97		pF
Output Capacitance	C_{oss}	V_{DS}=-15V		53		
Reverse Transfer Capacitance	C_{rss}	f=1MHz, See Fig.5		28		

Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-0.54	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-4.9	
Diode Forward Voltage	V_{SD}	T_J=25°C,I_S=-0.6A,V_{GS}=0V ③			-1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=-0.6A		35	53	ns
Reverse Recovery Charge	Q_{rr}	dI/dt=100A/μs ③		26	39	nC

Notes:

① Repetitive rating; pulse width limited bymax.junction temperature.(See fig.11)

② I_{SD}≤ -0.61A, di/dt ≤ 76A/μS, V_{DD} ≤ $V_{(BR)DSS}$,T_J≤ 150°C

③ Pulse width ≤ 300us; duty cycle ≤ 2%.

④ Surface mounted on FR-4 board, t≤ 5sec.

6.1Typical Characterisitics

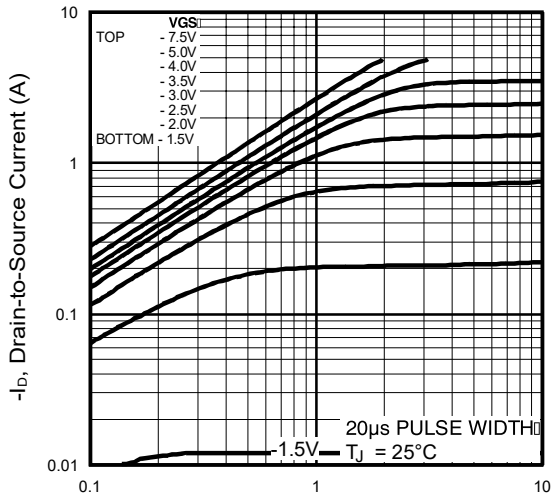


Fig 1. Typical Output Characteristics

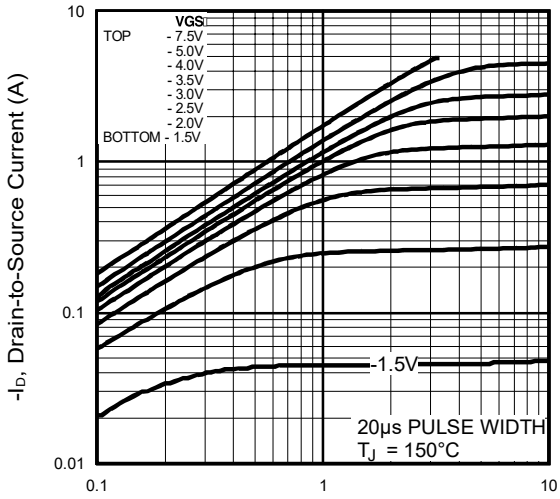


Fig 2. Typical Output Characteristics

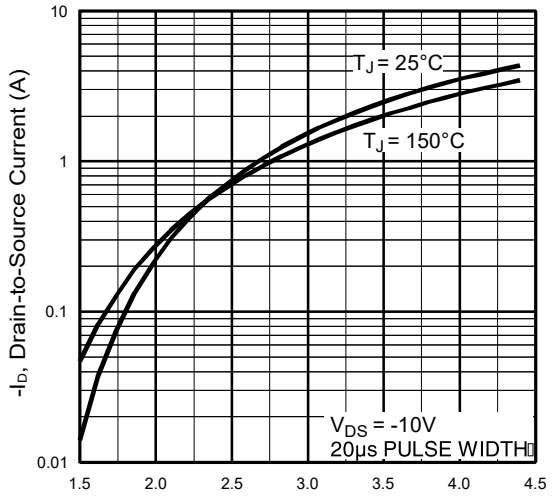


Fig 3. Typical Transfer Characteristics

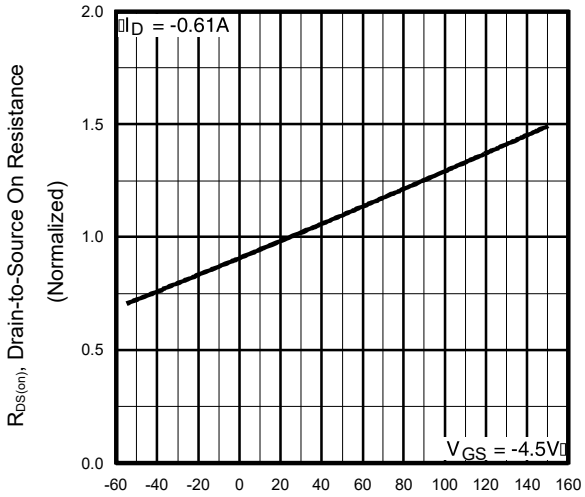
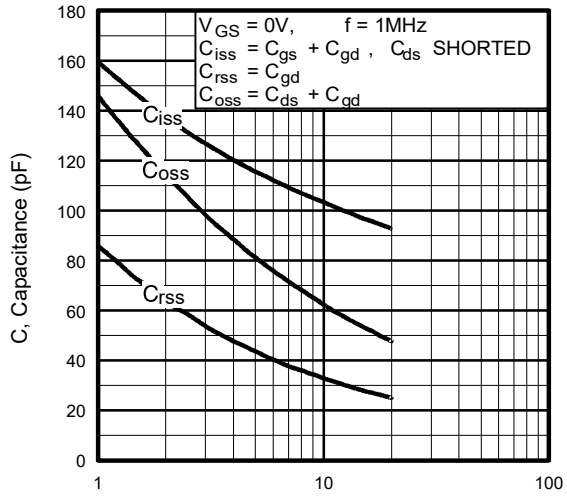


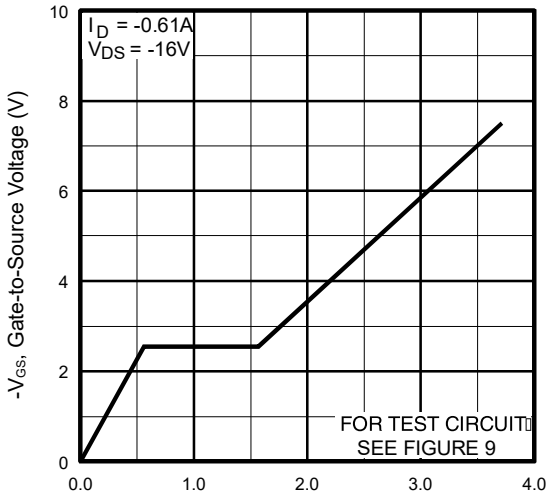
Fig 4. Nomalized On-ResistanceVs. Temperature

6.2Typical Characterisitics



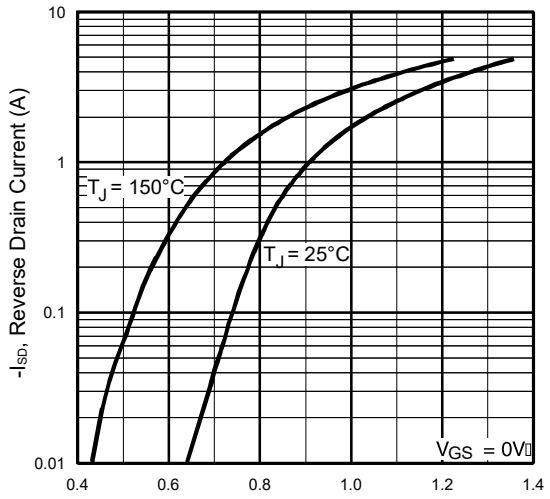
$-V_{DS}$,Drain-to-Source Voltage (V)

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



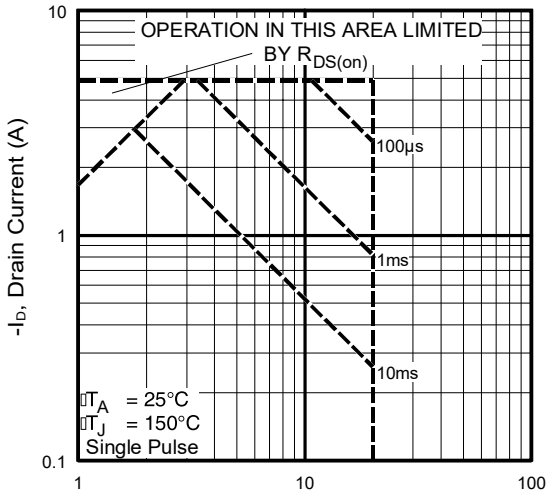
Q_G, Total Gate Charge (nC)

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

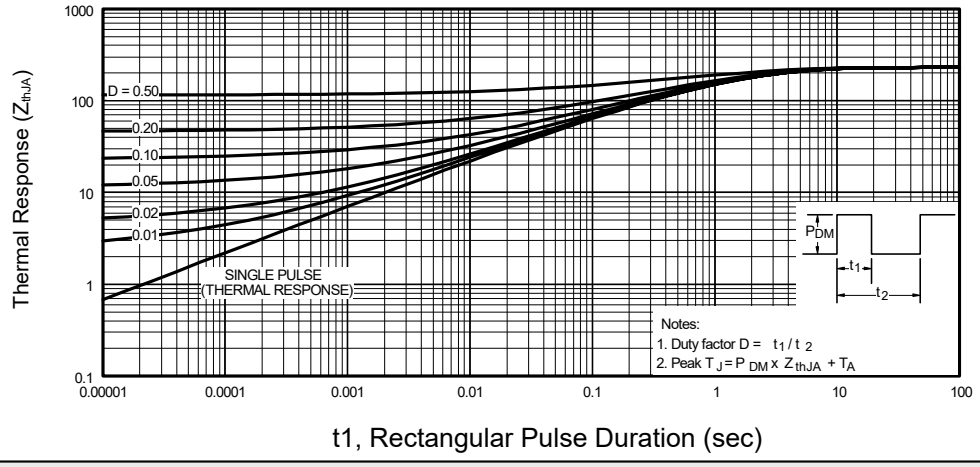


Figure 9. Maximum Effective Transient Themal Impedance, Junction-to-Ambient

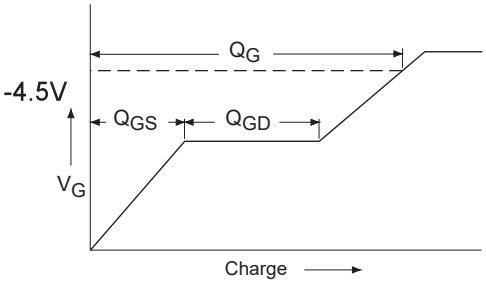


Fig 10a. Basic Gate Charge Wavefomm

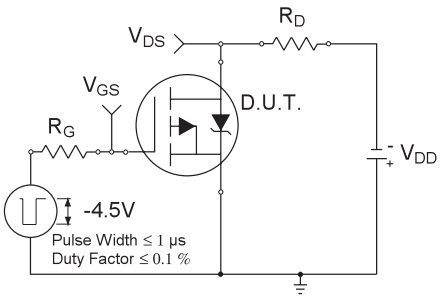


Fig 10a. Switching Time Test Circuit

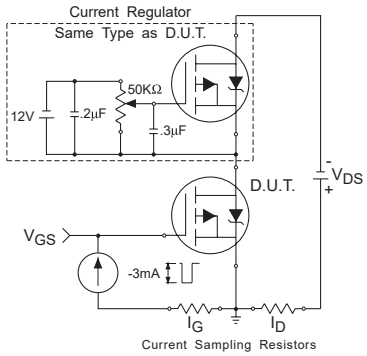


Fig 11a. Gate Charge Test Circuit

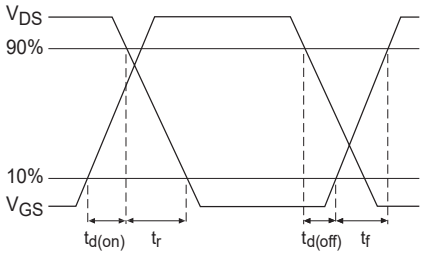
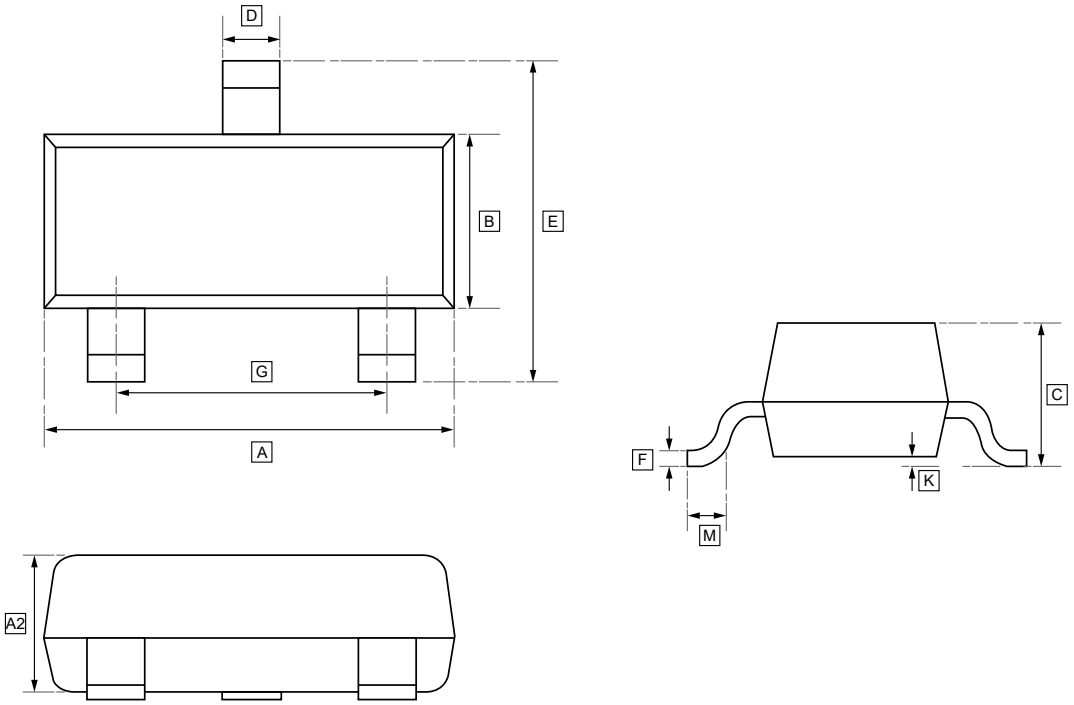


Fig 11b. Switching Time Wavefomms

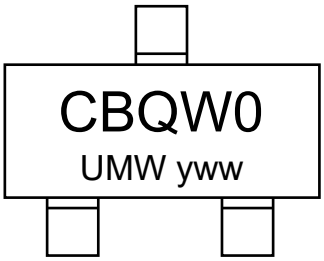
7.SOT-23 Package Outline Dimensions



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



yww: Batch Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRLML6302TR	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.

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