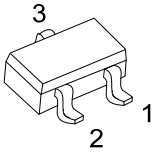
UML2502

Power MOSFET

N-CHANNEL POWER MOSFET



SOT-23

*Pb-free plating product number:UML2505L

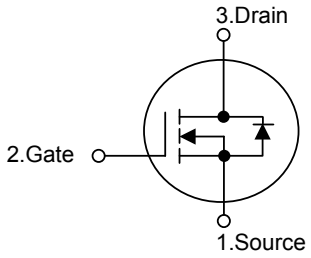
■ DESCRIPTION

The **UML2502** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

■ FEATURES

* $R_{DS(ON)}$ < 45mΩ@V_{GS} = 4.5V
* $R_{DS(ON)}$ < 80mΩ@V_{GS} = 2.5V
* Ultra low gate charge (max. 12nC)
* Low reverse transfer capacitance (C_{RSS} = typical 66pF)
* Fast switching capability
* Avalanche energy specified
* Improved dv/dt capability

■ SYMBOL

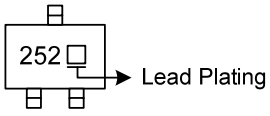


■ ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Normal	Lead Free Plating		1	2	3	
UML2502-AE3-R	UML2502L-AE3-R	SOT-23	S	G	D	Tape Reel

UML2502L-AE3-R (1)Packing Type (2)Package Type (3)Lead Plating	(1) R: Tape Reel (2) AE3: SOT-23 (3) L: Lead Free Plating, Blank: Pb/Sn

■ MARKING



■ ABSOLUTE MAXIMUM RATINGS (T_A =25℃, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DSS}	20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current V_{GS}=4.5V	I_D	4.2	A
Pulsed Drain Current (Note 2)	I_{DM}	33	A
Maximum Power Dissipation	P_D	1.25	W
Linear Derating Factor		0.01	W/℃
Junction Temperature	T_J	+150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Pulse width limited by $T_{J(MAX)}$

■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}		75	100	℃/W

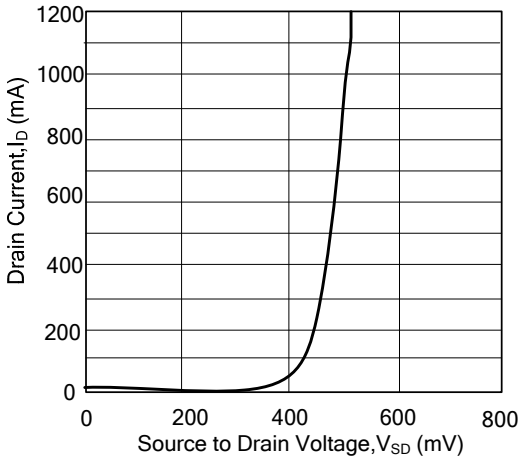
■ ELECTRICAL CHARACTERISTICS (T_J =25℃, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	20			V
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V, V_{DS}=16V			1.0	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to 25℃, I_D=1mA		0.01		V/℃
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	0.6		1.2	V
Drain-Source On-State Resistance (Note)	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=4.2A		35	45	mΩ
		V_{GS}=2.5V, I_D=3.6A		50	80	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C_{ISS}	V_{GS}=0V, V_{DS}=15V, f=1.0MHz		740		pF
Output Capacitance	C_{OSS}			90		pF
Reverse Transfer Capacitance	C_{RSS}			66		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time (Note)	$t_{D(ON)}$	V_{DS}=10V, R_G=6Ω, R_D=10Ω, I_D=1.0A		7.5		ns
Turn-ON Rise Time	t_R			10		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			54		ns
Turn-OFF Fall-Time	t_F			26		ns
Total Gate Charge (Note)	Q_G	V_{GS}=5.0V, V_{DS}=10V, I_D=4.0A		8.0	12	nC
Gate Source Charge	Q_{GS}			1.8	2.7	nC
Gate Drain Charge	Q_{GD}			1.7	2.6	nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1.3A, T_J=25℃ (Note)			1.2	V
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				33	A
Maximum Continuous Drain-Source Diode Forward Current	I_S				1.3	A
Reverse Recovery Time	t_{RR}	I_F=1.3A, dI/dt=100A/μs, T_J=25℃ (Note)		16	24	ns
Reverse Recovery Charge	Q_{RR}			8.6	13	nC

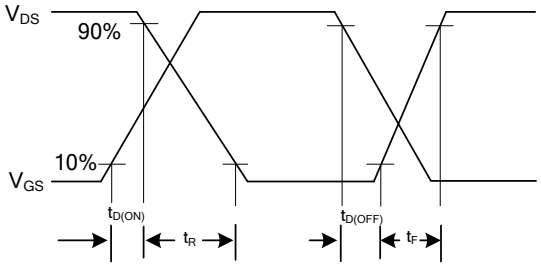
Notes: Pulse width ≤ 300μs; duty cycle ≤ 2%.

■ TYPICAL CHARACTERISTICS

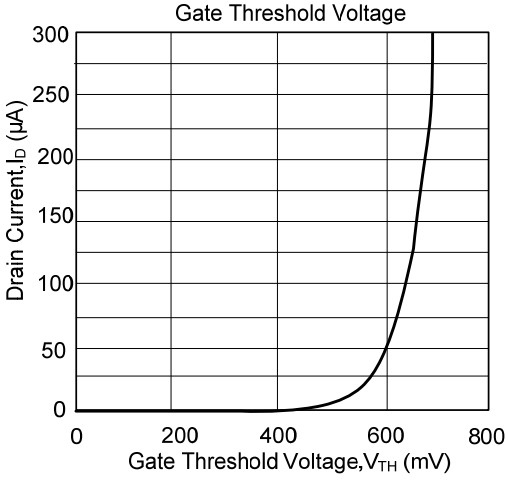
Drain Current vs. Source to Drain Voltage



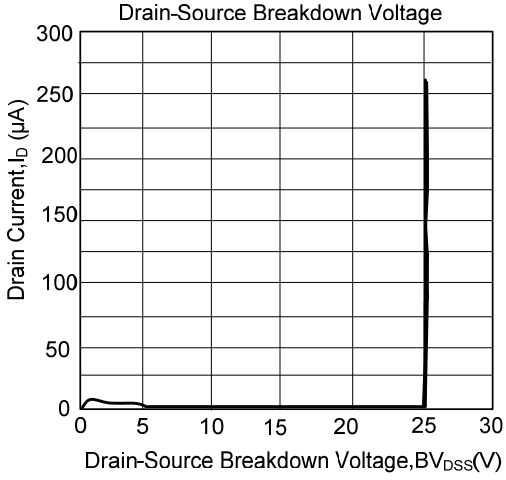
Switching Time Waveforms



Drain Current vs.
Gate Threshold Voltage



Drain Current vs.
Drain-Source Breakdown Voltage



Drain-Source On-State
Resistance Characteristics