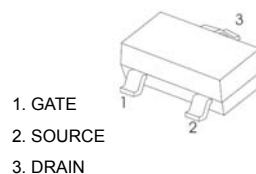


SOT-23 Plastic-Encapsulate MOSFETS

UMW IRLML2502 N-Channel 20-V(D-S) MOSFET

| $V_{(BR)DSS}$ | $R_{DS(on)MAX}$ | I_D |
|---------------|-----------------|-------|
| 20V | 45mΩ@4.5V | 4.2A |
| | 80 mΩ@2.5V | |

SOT-23



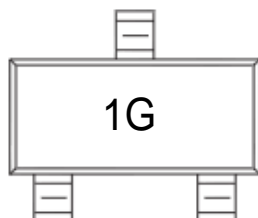
FEATURE

- TrenchFET Power MOSFET

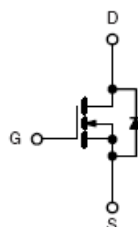
APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter

MARKING



Equivalent Circuit



Maximum ratings ($T_a=25^{\circ}C$ unless otherwise noted)

| Parameter | Symbol | Value | Unit |
|---|-----------------|------------|---------------|
| Drain-Source Voltage | V_{DS} | 20 | V |
| Gate-Source Voltage | V_{GS} | ±12 | |
| Continuous Drain Current | I_D | 4.2 | A |
| Continuous Source-Drain Current(Diode Conduction) | I_S | 0.6 | |
| Power Dissipation | P_D | 1.25 | W |
| Thermal Resistance from Junction to Ambient ($t \leq 5s$) | $R_{\theta JA}$ | 312.5 | $^{\circ}C/W$ |
| Operating Junction | T_J | 150 | $^{\circ}C$ |
| Storage Temperature | T_{STG} | -55 ~ +150 | |

SOT-23 Plastic-Encapsulate MOSFETS

$T_a=25^\circ\text{C}$ unless otherwise specified

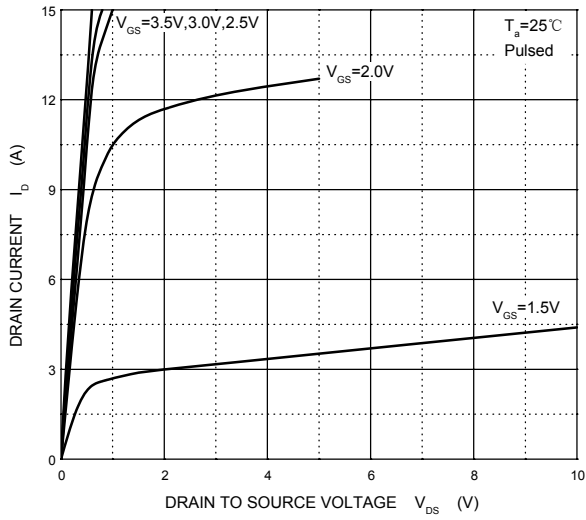
| Parameter | Symbol | Test Condition | Min | Typ | Max | Units |
|---|---------------|--|------|-------|-----------|----------|
| Static | | | | | | |
| Drain-source breakdown voltage | $V_{(BR)DSS}$ | $V_{GS} = 0V, I_D = 10\mu A$ | 20 | | | V |
| Gate-threshold voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 50\mu A$ | 0.65 | | 1.2 | |
| Gate-body leakage | I_{GSS} | $V_{DS} = 0V, V_{GS} = \pm 8V$ | | | ± 100 | nA |
| Zero gate voltage drain current | I_{DSS} | $V_{DS} = 20V, V_{GS} = 0V$ | | | 1 | μA |
| Drain-source on-resistance ^a | $r_{DS(on)}$ | $V_{GS} = 4.5V, I_D = 4.2A$ | | 0.035 | 0.045 | Ω |
| | | $V_{GS} = 2.5V, I_D = 3.6A$ | | 0.050 | 0.080 | |
| Forward transconductance ^a | g_{fs} | $V_{DS} = 5V, I_D = 3.6A$ | | 8 | | S |
| Diode forward voltage | V_{SD} | $I_S = 0.94A, V_{GS} = 0V$ | | 0.76 | 1.2 | V |
| Dynamic | | | | | | |
| Total gate charge | Q_g | $V_{DS} = 10V, V_{GS} = 4.5V, I_D = 3.6A$ | | 4.0 | 10 | nC |
| Gate-source charge | Q_{gs} | | | 0.65 | | |
| Gate-drain charge | Q_{gd} | | | 1.5 | | |
| Input capacitance ^b | C_{iss} | $V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$ | | 300 | | pF |
| Output capacitance ^b | C_{oss} | | | 120 | | |
| Reverse transfer capacitance ^b | C_{rss} | | | 80 | | |
| Switching^b | | | | | | |
| Turn-on delay time | $t_{d(on)}$ | $V_{DD} = 10V,$ $R_L = 5.5\Omega, I_D \approx 3.6A,$ $V_{GEN} = 4.5V, R_g = 6\Omega$ | | 7 | 15 | ns |
| Rise time | t_r | | | 55 | 80 | |
| Turn-off delay time | $t_{d(off)}$ | | | 16 | 60 | |
| Fall time | t_f | | | 10 | 25 | |

Notes :

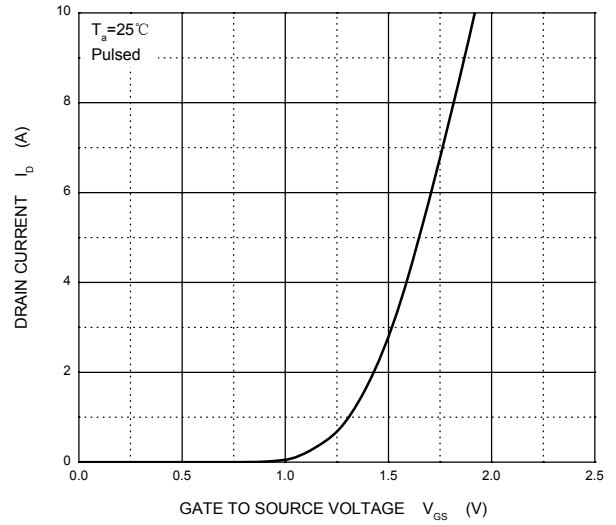
- a. Pulse Test : Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- b. These parameters have no way to verify.

SOT-23 Plastic-Encapsulate MOSFETS

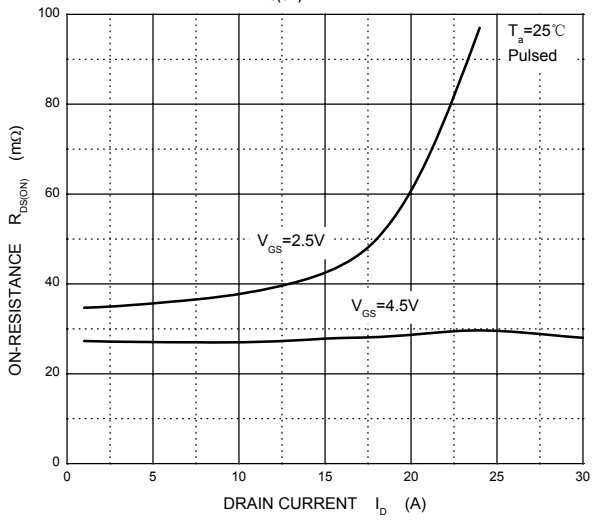
Output Characteristics



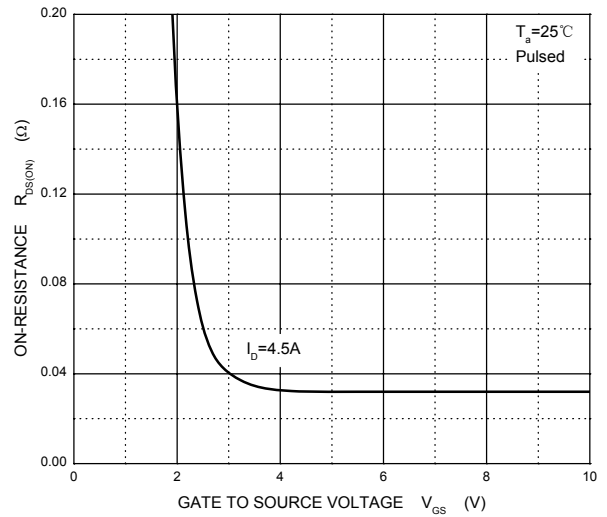
Transfer Characteristics



$R_{DS(ON)}$ — I_D

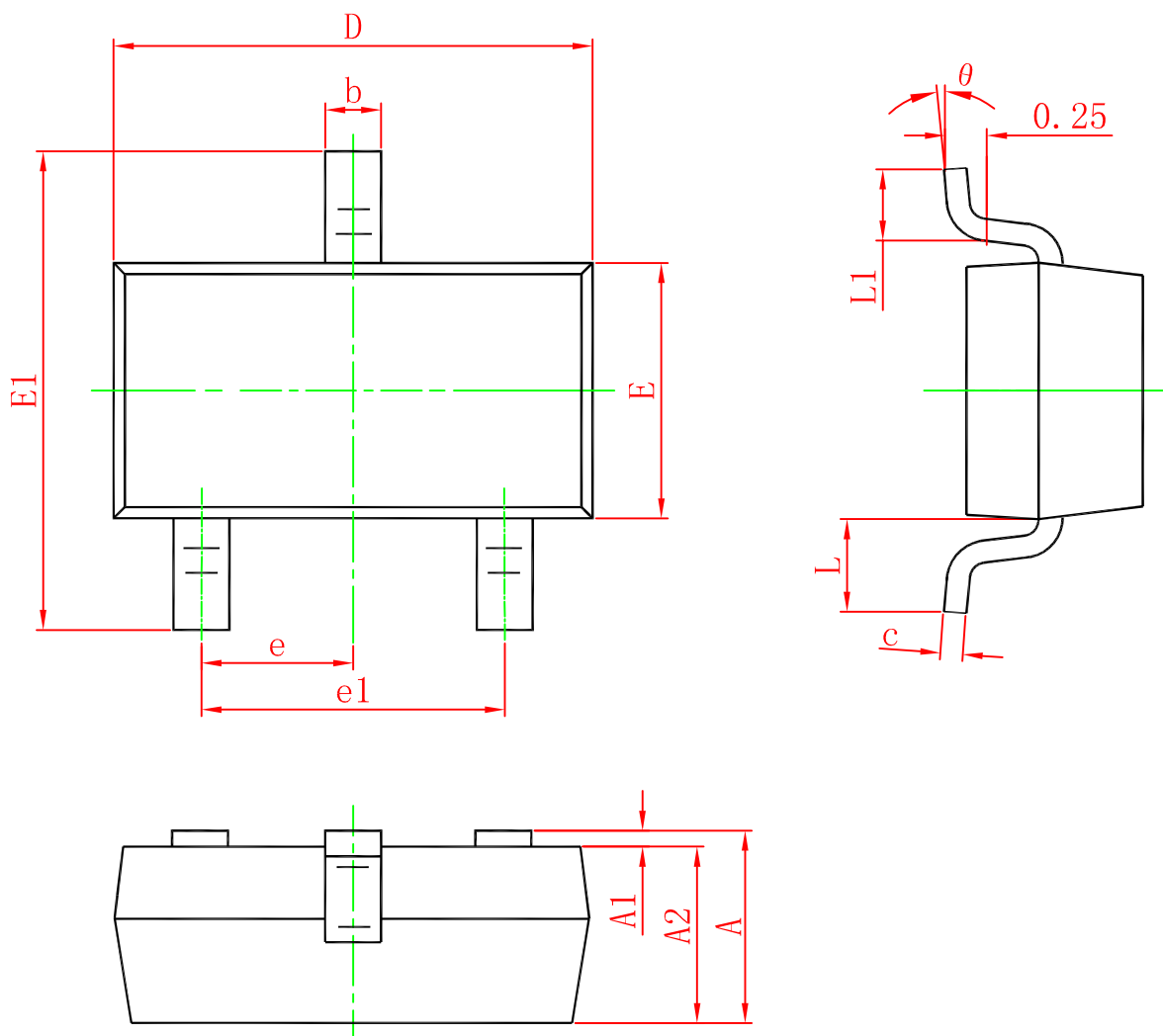


$R_{DS(ON)}$ — V_{GS}



SOT-23 Plastic-Encapsulate MOSFETS

SOT-23 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|-------|----------------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 0.900 | 1.150 | 0.035 | 0.045 |
| A1 | 0.000 | 0.100 | 0.000 | 0.004 |
| A2 | 0.900 | 1.050 | 0.035 | 0.041 |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| c | 0.080 | 0.150 | 0.003 | 0.006 |
| D | 2.800 | 3.000 | 0.110 | 0.118 |
| E | 1.200 | 1.400 | 0.047 | 0.055 |
| E1 | 2.250 | 2.550 | 0.089 | 0.100 |
| e | 0.950 TYP. | | 0.037 TYP. | |
| e1 | 1.800 | 2.000 | 0.071 | 0.079 |
| L | 0.550 REF. | | 0.022 REF. | |
| L1 | 0.300 | 0.500 | 0.012 | 0.020 |
| θ | 0° | 8° | 0° | 8° |

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