



# WM02N45M

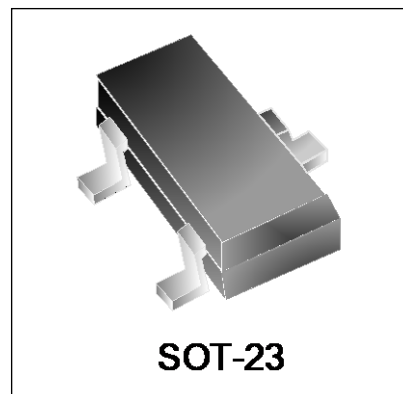
## N-Channel MOSFET

### Features

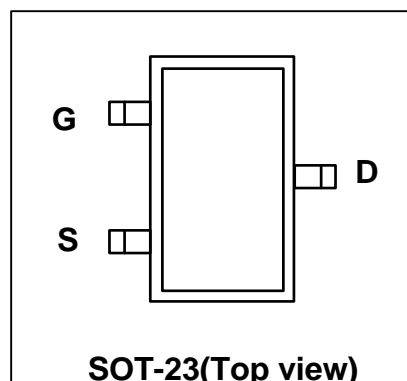
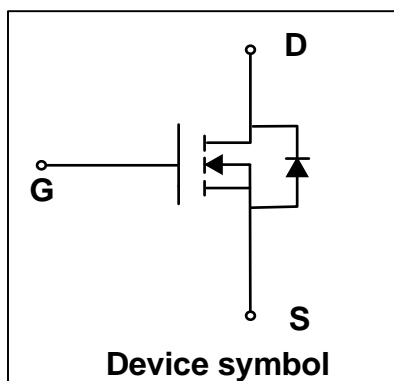
- $V_{DS} = 20\text{ V}$ ,  $I_D = 4.5\text{ A}$   
 $R_{DS(on)} < 30\text{ m}\Omega$  @  $V_{GS} = 4.5\text{ V}$   
 $R_{DS(on)} < 38\text{ m}\Omega$  @  $V_{GS} = 2.5\text{ V}$
- High Power and Current Handling Capability
- Lead Free Product is Acquired
- Surface Mount Package

### Mechanical Characteristics

- SOT-23 Package
- Marking : Making Code
- RoHS Compliant



### Schematic & PIN Configuration



### Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Continuous Drain Current	$I_D$	$T_C = 25^\circ\text{C}$	4.5
		$T_C = 100^\circ\text{C}$	3.0
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	18	A
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Power Dissipation	$P_D$	1	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55 to +150	$^\circ\text{C}$
Thermal Resistance from Junction to Ambient <sup>2</sup>	$R_{\theta JA}$	125	$^\circ\text{C/W}$

**Electrical Characteristics (T<sub>amb</sub>=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250μA	20	-	-	V
Gate Threshold Voltage <sup>3</sup>	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250μA	0.5	0.7	0.9	
Drain Cut-off Current	I <sub>DSS</sub>	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0 V	-	-	1	μA
Gate leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0 V	-	-	±100	nA
Drain-Source On-state Resistance <sup>3</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.5A	-	21	30	mΩ
		V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 4.0A	-	25	38	
Forward Trans conductance <sup>3</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 4.5A	-	5	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 10V, f = 1 MHz	-	482	-	pF
Output Capacitance	C <sub>oss</sub>		-	85	-	
Reverse Transfer Capacitance	C <sub>rss</sub>		-	52	-	
<b>Switching Characteristics</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 4.5A, V <sub>DS</sub> = 10V	-	4.2	-	nC
Gate-Source Charge	Q <sub>gs</sub>		-	0.9	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	1.4	-	
Turn-On Time <sup>4</sup>	t <sub>d(on)</sub>	V <sub>GS</sub> = 4.5V, V <sub>DD</sub> = 10V, R <sub>L</sub> = 2.8Ω, R <sub>GEN</sub> = 6Ω, I <sub>D</sub> = 1A	-	13	-	ns
Rise time <sup>4</sup>	t <sub>r</sub>		-	54	-	
Turn-Off Time <sup>4</sup>	t <sub>d(off)</sub>		-	18	-	
Fall time <sup>4</sup>	t <sub>f</sub>		-	11	-	
<b>Source-Drain Diode Characteristics</b>						
Body Diode Voltage	V <sub>DS</sub>	I <sub>S</sub> = 4.5A, V <sub>GS</sub> = 0V	-	-	1.2	V

**Notes:**

1. Repetitive rating : Pulse width limited by junction temperature.
2. Surface mounted on FR4 board , t≤10s.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle≤2%.
4. Guaranteed by design, not subject to producing.

Typical Characteristics

Figure 1. Output Characteristics

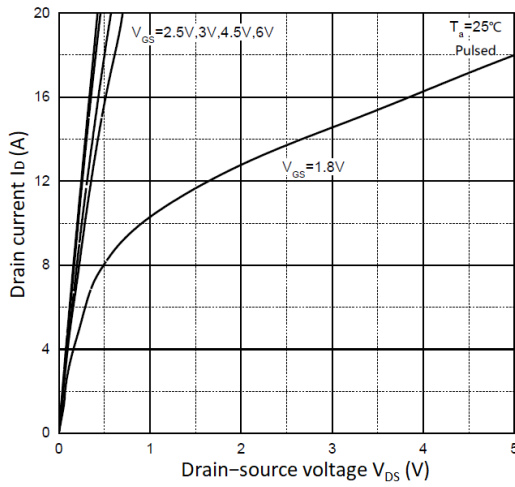


Figure 2. Transfer Characteristics

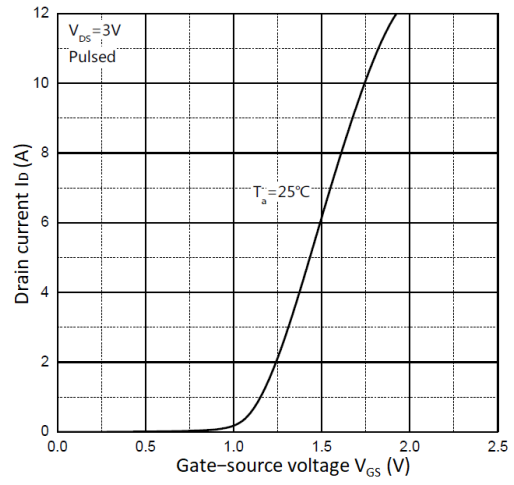


Figure 3.  $R_{DS(on)}$  vs.  $I_D$

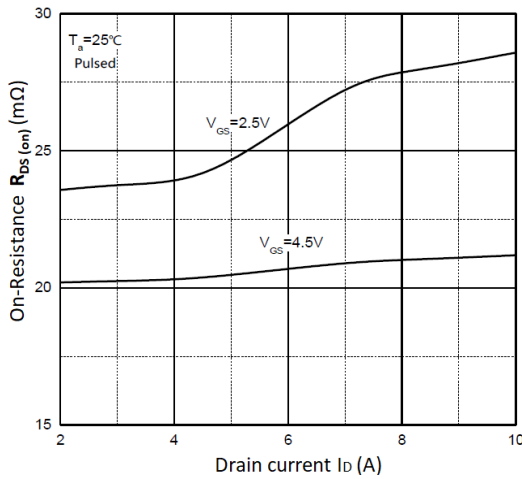


Figure 4.  $R_{DS(on)}$  vs.  $V_{GS}$

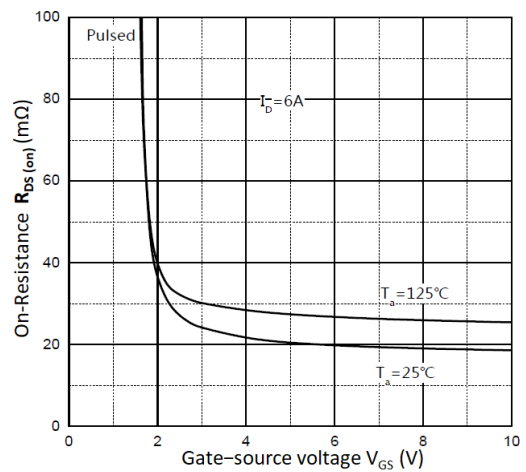


Figure 5.  $I_S$  vs.  $V_{SD}$

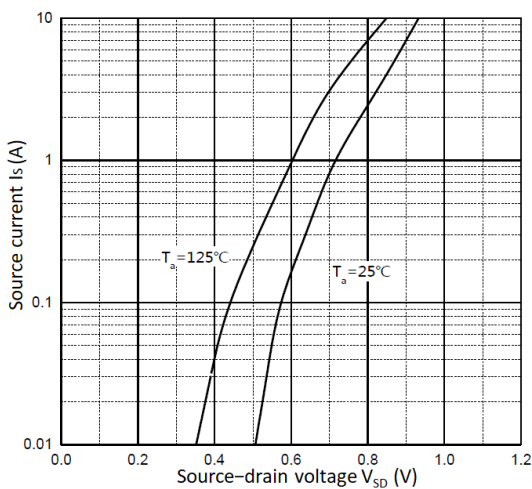
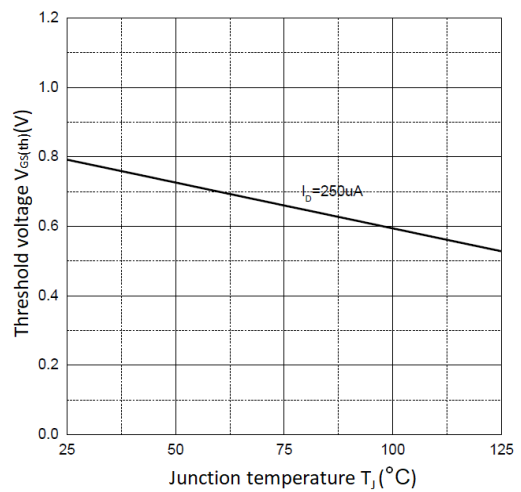


Figure 6.  $V_{GS(th)}$  vs.  $T_J$



Outline Drawing – SOT-23

### PACKAGE OUTLINE

**SOT-23**

SYMBOL	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.15	0.035	0.045
A1	0.00	0.10	0.000	0.004
b	0.30	0.50	0.012	0.020
c	0.08	0.15	0.003	0.006
D	2.80	3.00	0.110	0.118
E	2.25	2.55	0.089	0.100
E1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 BSC	
e1	1.80	2.00	0.071	0.079
L	0.45	0.65	0.018	0.026
θ	0°	8°	0°	8°

DIMENSIONS		
DIM	INCHES	MILLIMETERS
M	0.080	2.02
C	0.032	0.80
Z	0.111	2.82
e	0.037 BSC	0.95 BSC
e1	0.075 BSC	1.9 BSC
b	0.032	0.80

**Notes**

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Pin 3 is the cathode (Unidirectional Only).
4. Dimensions are exclusive of mold flash and metal burrs.

**Marking Codes**

Part Number	WM02N45M
Marking Code	

**Package Information**

Qty: 3k/Reel

**CONTACT INFORMATION**

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*Specifications are subject to change without notice.  
 The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.  
 Users should verify actual device performance in their specific applications.*