

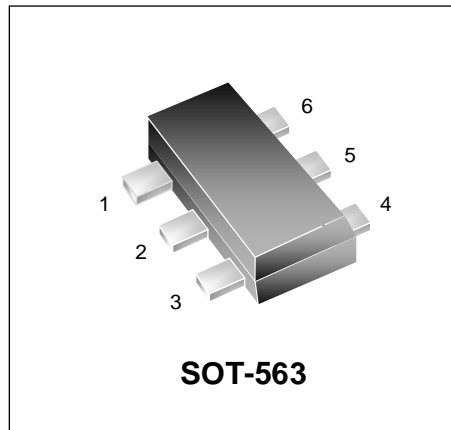


# WM02DH08T

## N+P Dual Channel MOSFET

### Features

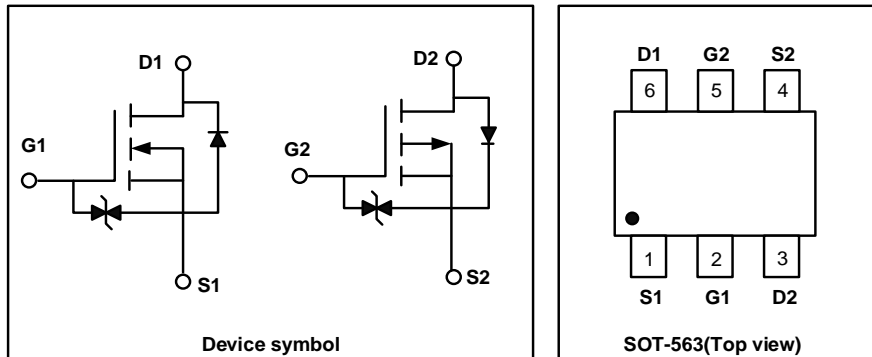
- N - Channel:  
 $V_{DS} = 20V$ ,  $I_D = 0.75A$   
 $R_{DS(on)} < 0.38\Omega$  @  $V_{GS} = 4.5V$   
 $R_{DS(on)} < 0.45\Omega$  @  $V_{GS} = 2.5V$
- P - Channel:  
 $V_{DS} = -20V$ ,  $I_D = -0.66A$   
 $R_{DS(on)} < 0.52\Omega$  @  $V_{GS} = -4.5V$   
 $R_{DS(on)} < 0.70\Omega$  @  $V_{GS} = -2.5V$
- ESD Protected



### Mechanical Characteristics

- SOT-563 Package
- Marking : Making Code
- RoHS Compliant

### Schematic & PIN Configuration



### Absolute Maximum Ratings

Parameter	Symbol	Value		Unit
Drain-Source Voltage	$V_{DSS}$	20	-20	V
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	$\pm 12$	
Continuous Drain Current	$I_D$	0.75	-0.66	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	1.8	-1.2	
Power Dissipation	$P_D$	290	290	mW
Thermal Resistance from Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	430		$^{\circ}C/W$
Junction Temperature	$T_J$	150		$^{\circ}C$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150		$^{\circ}C$

Electrical Characteristics N-Channel ( $T_{amb}=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	20	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20\text{V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{V}$	-	-	$\pm 20$	$\mu\text{A}$
Drain-Source on-State Resistance <sup>3</sup>	$R_{DS(on)}$	$V_{GS} = 4.5\text{V}, I_D = 0.65\text{A}$	-	0.19	0.38	$\Omega$
		$V_{GS} = 2.5\text{V}, I_D = 0.55\text{A}$	-	0.26	0.45	
		$V_{GS} = 1.8\text{V}, I_D = 0.45\text{A}$	-	0.39	-	
Gate Threshold Voltage <sup>3</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.35	0.75	1.1	V
Forward Transconductance	$g_{fs}$	$V_{DS} = 10\text{V}, I_D = 0.80\text{A}$	-	1.6	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = 16\text{V}, f = 1\text{MHz}$	-	55	-	$\mu\text{F}$
Output Capacitance	$C_{oss}$		-	11	-	
Reverse Transfer Capacitance	$C_{rss}$		-	8	-	
<b>Switching Characteristics</b>						
Turn-on Delay Time <sup>4</sup>	$t_{d(on)}$	$V_{DS} = 10\text{V}, V_{GS} = 4.5\text{V}, I_D = 0.5\text{A}, R_{GEN} = 10\Omega$	-	6.7	-	ns
Turn-on Rise Time <sup>4</sup>	$t_r$		-	4.8	-	
Turn-off Delay Time <sup>4</sup>	$t_{d(off)}$		-	17.3	-	
Turn-off Fall Time <sup>4</sup>	$t_f$		-	7.4	-	
<b>Source-Drain Diode Characteristics</b>						
Body Diode Voltage <sup>3</sup>	$V_{SD}$	$I_S = 0.15\text{A}, V_{GS} = 0\text{V}$	-	-	1.2	V

Electrical Characteristics P-Channel ( $T_{amb}=25^{\circ}\text{C}$  unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-20	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -20\text{V}, V_{GS} = 0\text{ V}$	-	-	-1	$\mu\text{A}$
Gate-Body Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{V}$	-	-	$\pm 20$	$\mu\text{A}$
Drain-Source On-state Resistance <sup>3</sup>	$R_{DS(on)}$	$V_{GS} = -4.5\text{V}, I_D = -0.66\text{A}$	-	0.45	0.52	$\Omega$
		$V_{GS} = -2.5\text{V}, I_D = -0.60\text{A}$	-	0.68	0.78	
		$V_{GS} = -1.8\text{V}, I_D = -0.50\text{A}$	-	0.95	-	
Gate Threshold Voltage <sup>3</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	-0.3	-0.6	-1.1	V
Forward transconductance	$g_{fs}$	$V_{DS} = 10\text{V}, I_D = -0.54\text{A}$	-	1.2	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{V}, V_{DS} = -16\text{V}, f = 1\text{MHz}$	-	77	-	pF
Output Capacitance	$C_{oss}$		-	15	-	
Reverse Transfer Capacitance	$C_{rss}$		-	9	-	
<b>Switching Characteristics</b>						
Turn-on Delay Time <sup>4</sup>	$t_{d(on)}$	$V_{DS} = -10\text{V}, V_{GS} = -4.5\text{V}, I_D = -0.2\text{A}, R_G = 10\Omega$	-	9	-	ns
Turn-on Rise Time <sup>4</sup>	$t_r$		-	5.7	-	
Turn-off Delay Time <sup>4</sup>	$t_{d(off)}$		-	32.6	-	
Turn- off Fall Time <sup>4</sup>	$t_f$		-	20.3	-	
<b>Source-Drain Diode Characteristics</b>						
Body Diode Voltage <sup>3</sup>	$V_{SD}$	$I_S = -0.5\text{A}, V_{GS} = 0\text{V}$	-	-	-1.2	V

**Notes:**

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. For a device mounted on 25mm X 25mm FR-4 PCB board with a high coverage of single sided 1oz copper, in still air conditions with two active die.
3. Pulse Test : Pulse Width $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production testing.

Typical Characteristics: N-CHANNEL

Figure 1. Output Characteristics

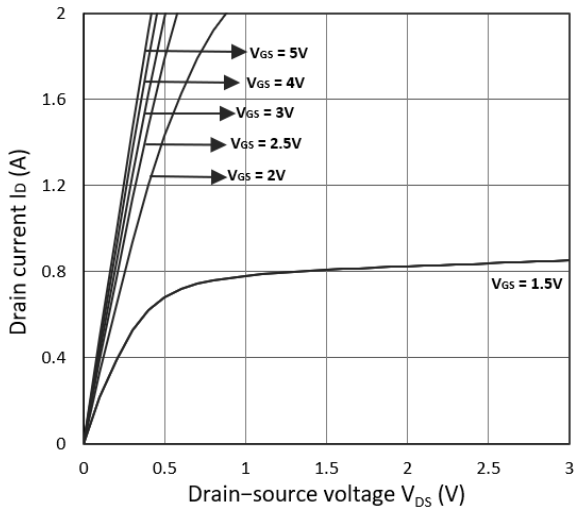


Figure 2. Transfer Characteristics

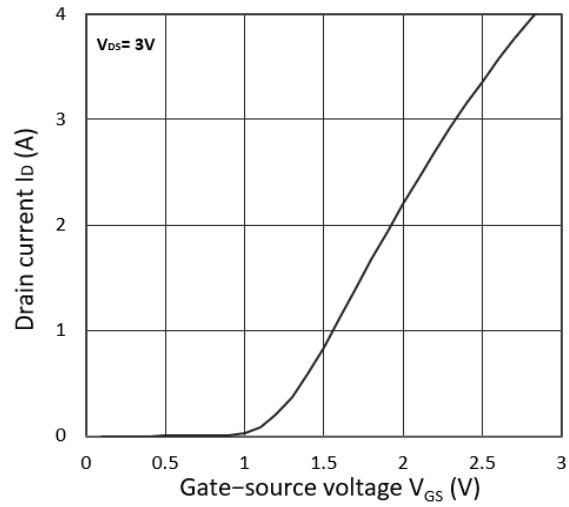


Figure 3.  $R_{DS(ON)}$  vs.  $I_D$

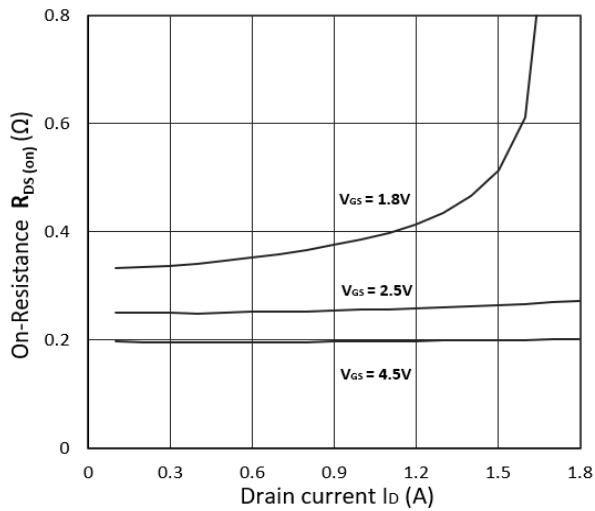


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

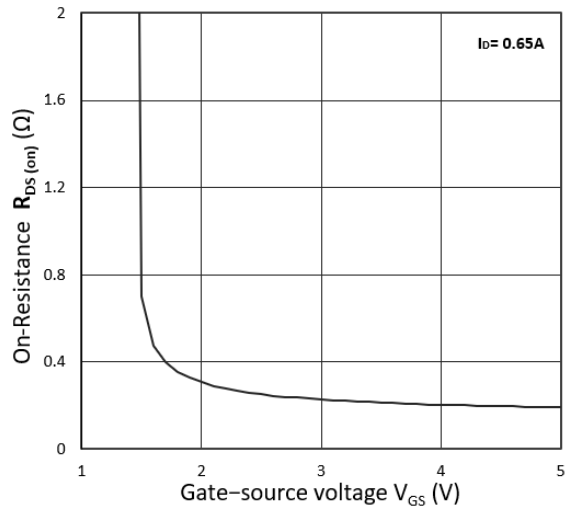


Figure 5.  $I_S$  vs.  $V_{SD}$

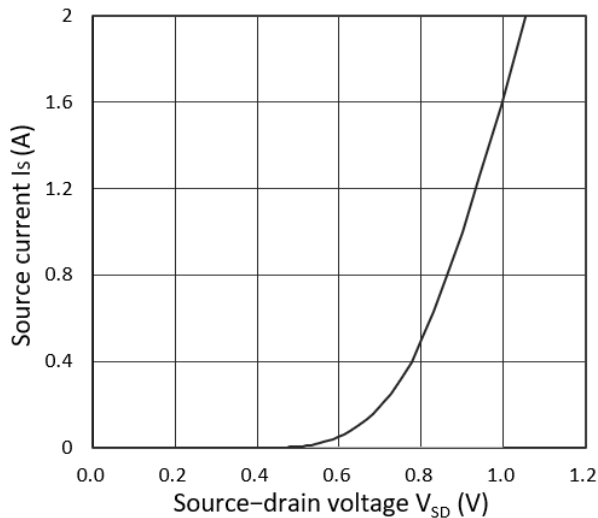
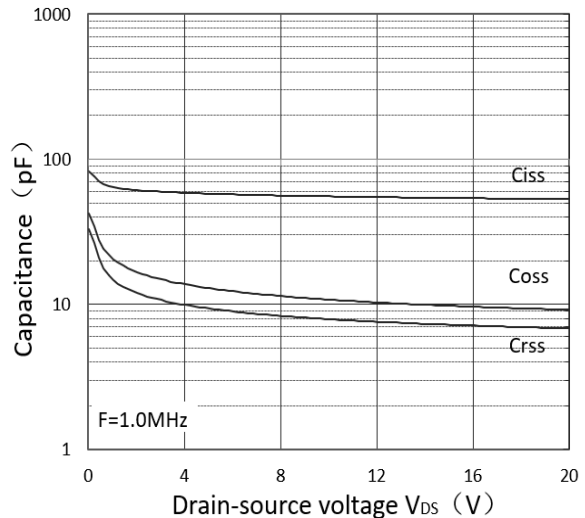


Figure 6. Capacitance Characteristics



### Typical Characteristics: P-CHANNEL

Figure 1. Output Characteristics

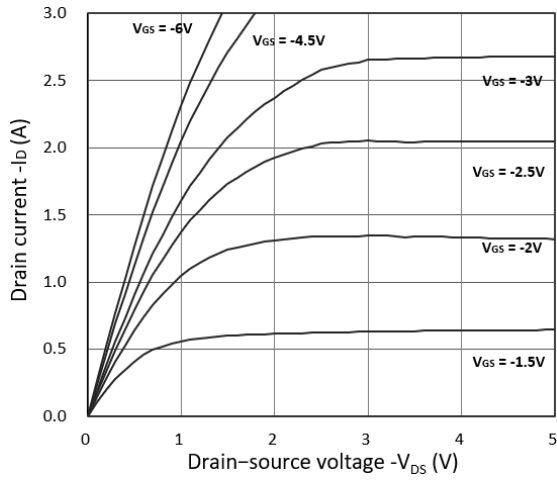


Figure 2. Transfer Characteristics

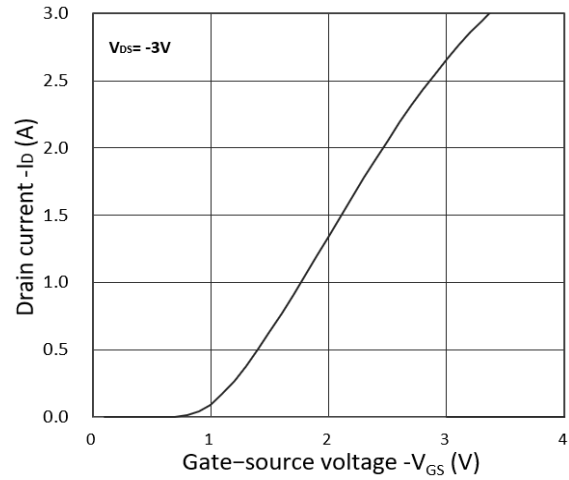


Figure 3.  $R_{DS(ON)}$  vs.  $I_D$

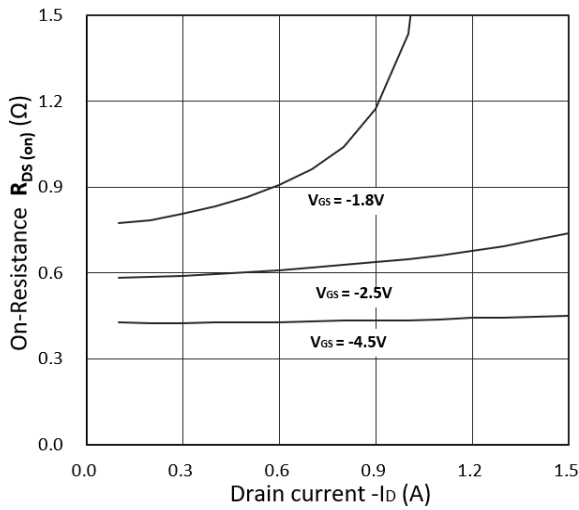


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

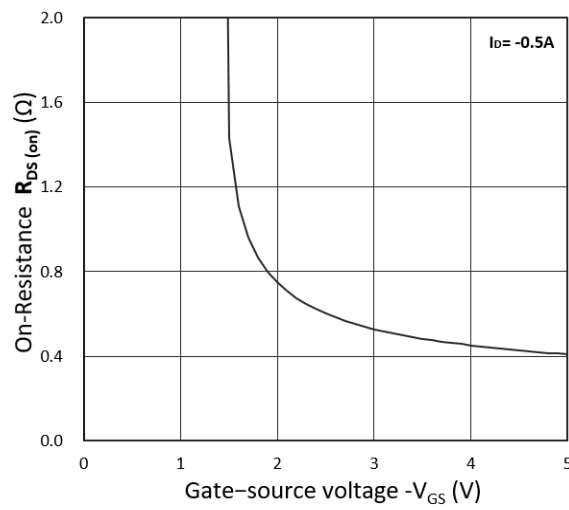


Figure 5.  $I_S$  vs.  $V_{SD}$

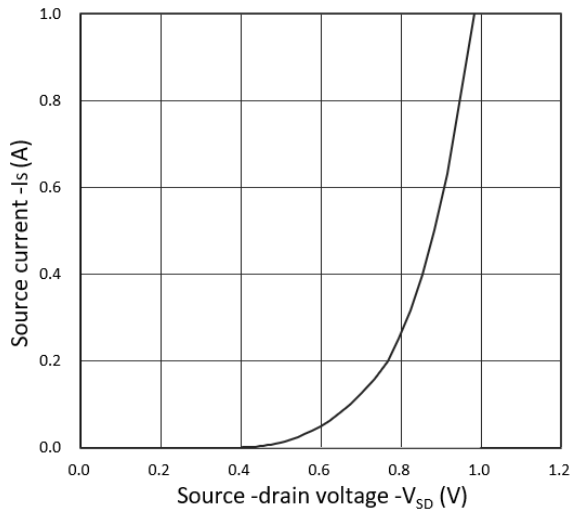
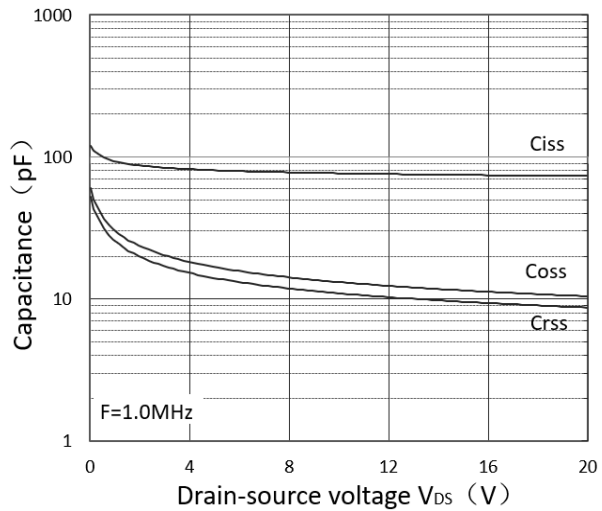


Figure 6. Capacitance Characteristics



Outline Drawing – SOT-563

**PACKAGE OUTLINE**

**SOT-563**

DIMENSIONS				
SYMBOL	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	0.021	0.024	0.525	0.600
A1	0.000	0.002	0.000	0.050
e	0.018	0.022	0.450	0.550
c	0.004	0.006	0.090	0.160
D	0.059	0.067	1.500	1.700
b	0.007	0.011	0.170	0.270
E1	0.043	0.051	1.100	1.300
E	0.059	0.067	1.500	1.700
L	0.004	0.012	0.100	0.300
$\theta$	7°REF		7°REF	

DIMENSIONS		
DIM	INCHES	MILLIMETERS
Z	0.0752	1.91
G	0.0350	0.89
P	0.020TYP	0.51 TYP
X	0.0118	0.3
Y	0.0201	0.51

**Notes**

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Dimensions are exclusive of mold flash and metal burrs.

**Marking Codes**

Part Number	WM02DH08T
Marking Code	

**Package Information**

Qty: 3k/Reel

**CONTACT INFORMATION**

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For additional information, please contact your local Sales Representative.

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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.