



WM02DN50M3

Dual N-Channel Enhancement Mode MOSFET

Description

WM02DN50M3 uses advanced power trench technology that has been especially tailored to minimize the on-state resistance. This device is suitable for un-directional or bidirectional load switch, facilitated by its common-drain configuration.

$V_{(BR)DSS}(V)$	$I_D(A)$	$R_{DS(on)TYP}(m\Omega)$
20	5	27 @ $V_{GS}=4.5V$
		35 @ $V_{GS}=2.5V$

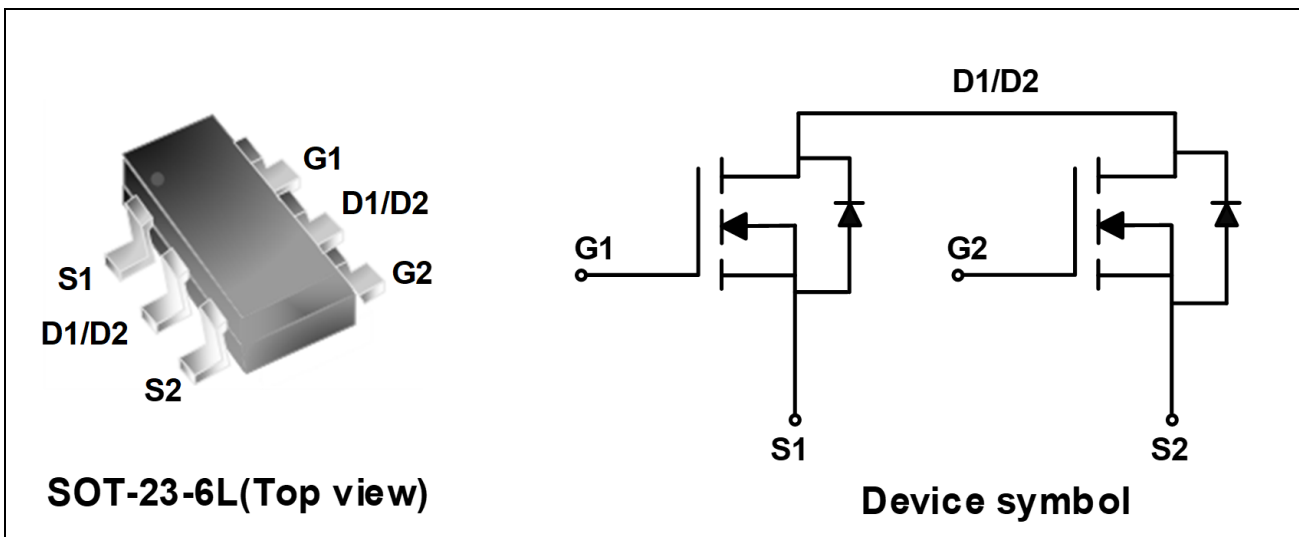
Features

- Super high dense cell for low $R_{DS(ON)}$
- RoHS Compliant and Halogen-Free

Applications

- Battery protection
- Load switch

Schematic & PIN Configuration



Absolute Maximum Rating

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	5	A
Power Dissipation	P_D	1.5	W
Pulsed Drain Current ¹	I_{DM}	25	A
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55 to +150	$^{\circ}C$
Thermal Resistance from Junction to Ambient ²	$R_{\theta JA}$	83.3	$^{\circ}C/W$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
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	μA
Gate-body Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{V}$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	0.5	0.7	1.2	V
Drain-Source On-state Resistance ³	$R_{DS(on)}$	$V_{GS} = 4.5\text{V}, I_D = 4.5\text{A}$	-	21	27	m Ω
		$V_{GS} = 2.5\text{V}, I_D = 3.5\text{A}$	-	26	35	
Dynamic Characteristics ⁴						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 8\text{V}, f = 1\text{MHz}$	-	400	-	pF
Output Capacitance	C_{oss}		-	80	-	
Reverse Transfer Capacitance	C_{rss}		-	70	-	
Switching Characteristics ⁴						
Total Gate Charge ⁴	Q_g	$V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}, I_D = 4\text{A}$	-	11	-	nC
Gate-Source Charge ⁴	Q_{gs}		-	2.3	-	
Gate-Drain Charge ⁴	Q_{gd}		-	2.5	-	
Turn-on Time ⁴	$t_{d(on)}$	$V_{DD} = 10\text{V}, V_{GS} = 4\text{V}, I_D = 1\text{A}, R_{REN} = 10\Omega$	-	18	-	ns
Rise Time ⁴	t_r		-	5	-	
Turn-off Time ⁴	$t_{d(off)}$		-	43	-	
Fall Time ⁴	t_f		-	20	-	
Source-Drain Diode characteristics						
Body Diode Voltage	V_{SD}	$I_S = 1.7\text{A}, V_{GS} = 0\text{V}$	-	-	1.2	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface mounted on FR4 board using 1 square inch pad size, 1oz single-side copper.
3. Pulse Test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 0.5\%$.
4. Guaranteed by design, not subject to product.

Typical Characteristics

Figure 1. Output Characteristics

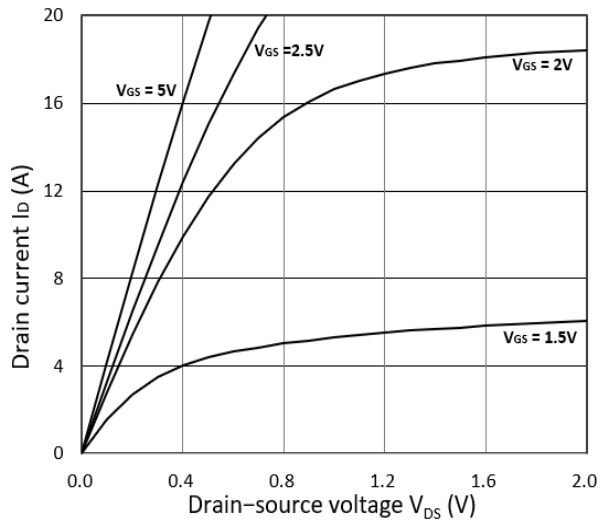


Figure 2. Transfer Characteristics

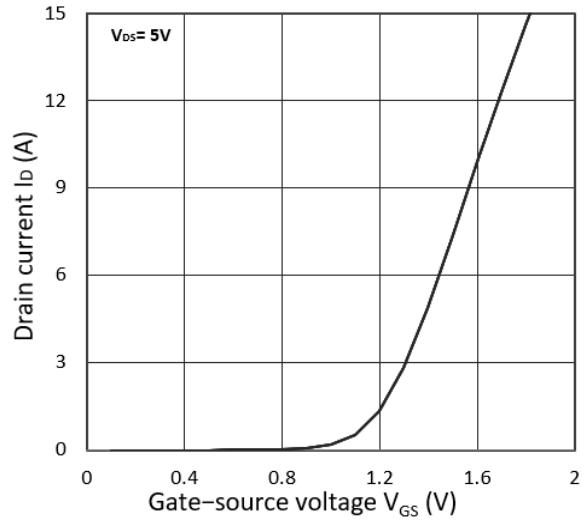


Figure 3. $R_{DS(ON)}$ vs. I_D

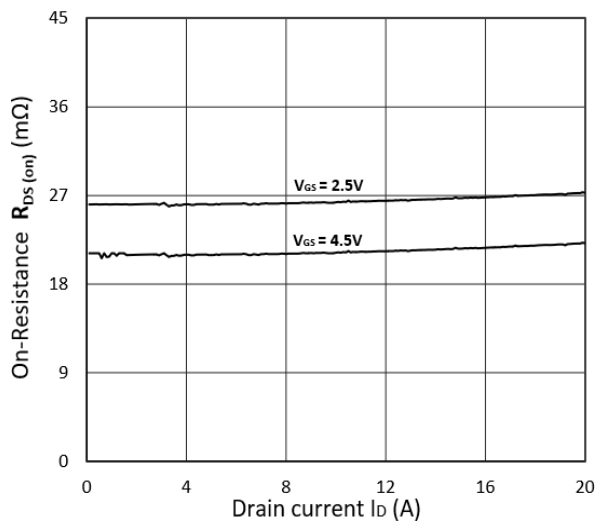


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

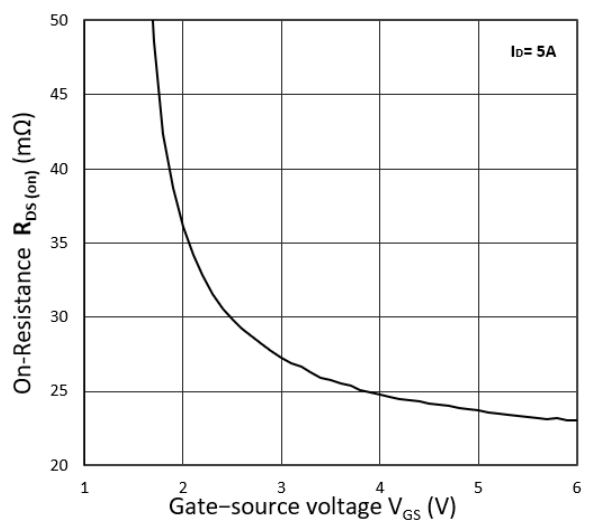


Figure 5. I_S vs. V_{SD}

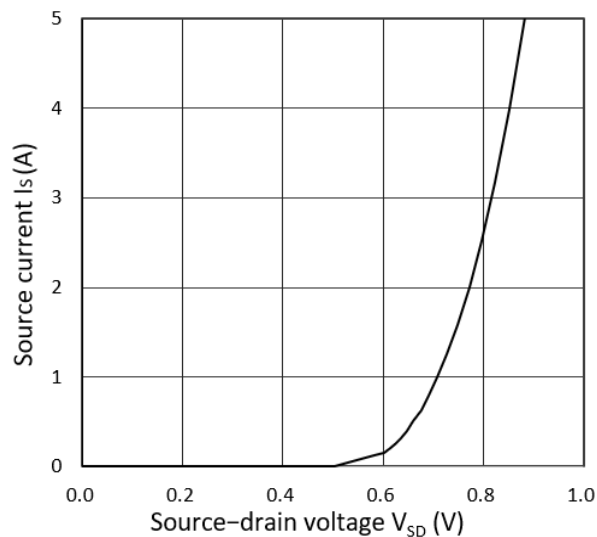
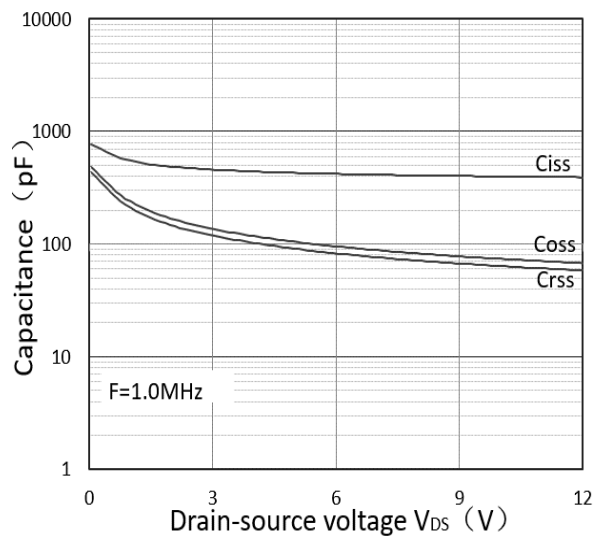


Figure 6. Capacitance Characteristics



Outline Drawing –SOT-23-6L

PACKAGE OUTLINE

SIDE VIEW SEE DETAIL A

DETAIL A

NOTES:

- Controlling Dimensions are In Millimeters (Angles In Degrees).
- Datums **A** And **B** To Be Determined At Datum Plane **H**.
- Dimensions "E1" And "D" Do Not Include Mold Flash, Protrusions Or Gate Burrs.

SOT-23-6L

DIMENSIONS

DIM	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.035	-	0.057	0.90	-	1.45
A1	0.000	-	0.006	0.00	-	0.15
A2	0.035	0.045	0.051	0.90	1.15	1.30
b	0.010	-	0.020	0.25	-	0.50
c	0.003	-	0.009	0.08	-	0.22
D	0.110	0.114	0.122	2.80	2.90	3.10
E1	0.060	0.063	0.069	1.50	1.60	1.75
E	0.114 BSC			2.90 BSC		
e	0.037 BSC			0.95 BSC		
e1	0.075 BSC			1.90 BSC		
L	0.012	0.018	0.024	0.30	0.45	0.60
L1	0.026 BSC			0.65 BSC		
θ1	0°	-	10°	0°	-	10°
N	6			6		
aaa	0.004			0.10		
bbb	0.008			0.20		
ccc	0.008			0.20		

DIMENSIONS		
DIM	INCHES	MILLIMETERS
C	(.098)	(2.50)
G	.055	1.40
P	.037	0.95
X	.024	0.60
Y	.043	1.10
Z	.141	3.60

Notes

THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

Marking Codes

Part Number	WM02DN50M3
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.