

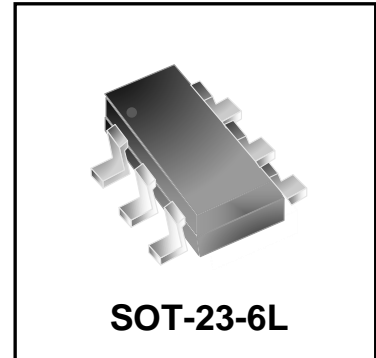


# WM02P40M3

## P-Channel MOSFET

### Features

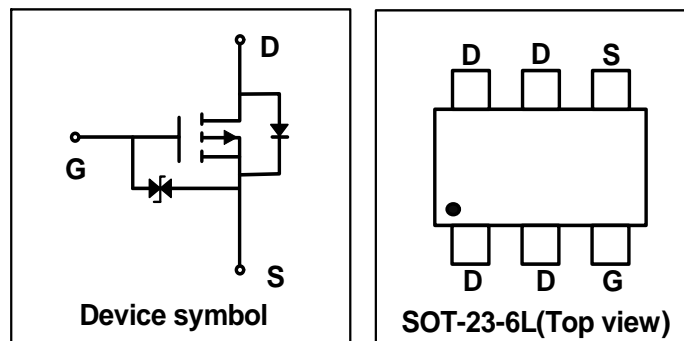
- $V_{DS} = -20\text{ V}$ ,  $I_D = -4.0\text{ A}$   
 $R_{DS(on)} < 48\text{ m}\Omega @ V_{GS} = -4.5\text{ V}$   
 $R_{DS(on)} < 60\text{ m}\Omega @ V_{GS} = -2.5\text{ V}$
- Excellent  $R_{DS(on)}$
- Low Gate Charge, Low Gate Voltages
- ESD Protected



### Mechanical Characteristics

- SOT-23-6L Package
- Marking : Making Code
- RoHS Compliant

### Schematic & PIN Configuration



### Absolute Maximum Rating

Rating	Symbol	Value	Units
Drain-Source Voltage	$V_{DS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 8$	
Continuous Drain Current( $t \leq 10\text{s}$ )	$I_D$	-4.0	A
Power Dissipation( $t \leq 10\text{s}$ )	$P_D$	0.45	W
Thermal Resistance from Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	277	$^{\circ}\text{C/W}$
Operating Junction Temperature	$T_J$	150	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55 to 150	$^{\circ}\text{C}$

## Electrical Characteristics (Tamb=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	-	-	V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.3	-0.73	-1	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 8V$	-	-	$\pm 10$	$\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -16V, V_{GS} = 0V$	-	-	-1	
Drain-Source on-Resistance <sup>2</sup>	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -4A$	-	30	48	m $\Omega$
		$V_{GS} = -2.5V, I_D = -4A$	-	40	60	
		$V_{GS} = -1.8V, I_D = -2A$	-	60	88	
Forward Transconductance <sup>2</sup>	$g_{fs}$	$V_{DS} = -5V, I_D = -4A$	-	8	-	S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = -10V, f = 1.0MHz$	-	1150	-	$\mu F$
Output Capacitance	$C_{oss}$		-	166	-	
Reverse Transfer Capacitance	$C_{rss}$		-	120	-	
<b>Switching Characteristics</b>						
Gate Resistance	$R_g$	$V_{GS} = 0V, V_{DS} = 0V, f = 1.0MHz$	-	6.5	-	$\Omega$
Total Gate Charge	$Q_g$	$V_{GS} = -4.5V, V_{DS} = -10V, I_D = -4A$	-	17.2	-	nC
Gate-Source Charge	$Q_{gs}$		-	1.3	-	
Gate-Drain Charge	$Q_{gd}$		-	4.5	-	
Turn-on Delay Time <sup>3</sup>	$t_{d(on)}$	$V_{DS} = -10V, V_{GS} = -4.5V$ $R_L = 2.5\Omega, R_{GEN} = 3\Omega,$	-	9.5	-	ns
Rise Time <sup>3</sup>	$t_r$		-	17	-	
Turn-off Delay Time <sup>3</sup>	$t_{d(off)}$		-	94	-	
Fall Time <sup>3</sup>	$t_f$		-	35	-	
<b>Drain-Source Body Diode Characteristics</b>						
Body Diode Voltage	$V_{DS}$	$I_S = -1A, V_{GS} = 0V$	-	-	-1.0	V

Notes: 1. Repetitive rating, pulse width limited by junction temperature.

2. Pulse Test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$

3. These parameters have no way to verify.

### Typical Characteristics

Figure 1. Output Characteristics

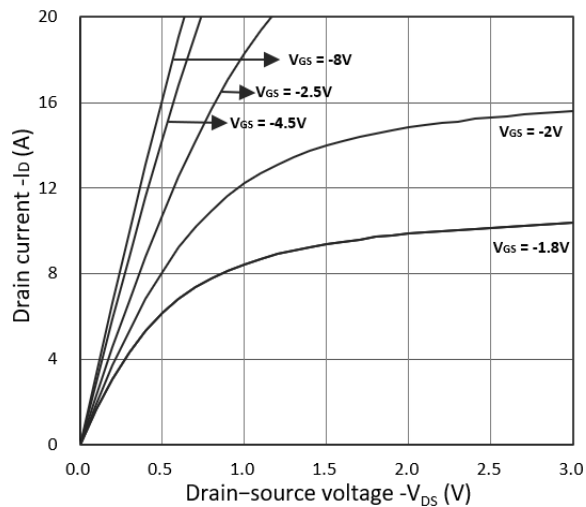


Figure 2. Transfer Characteristics

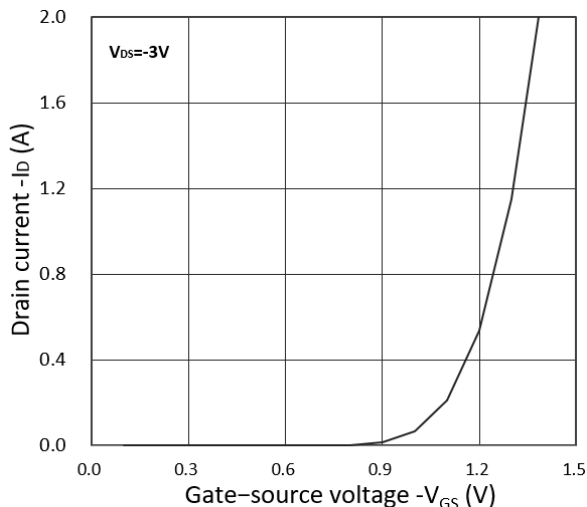


Figure 3.  $R_{DS(ON)}$  vs.  $I_D$

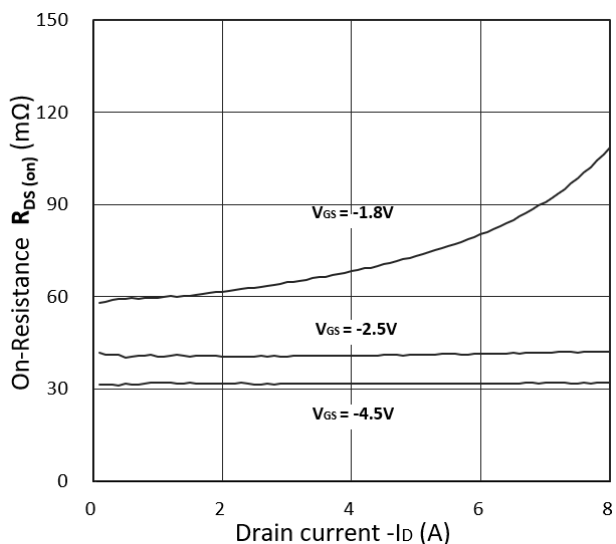


Figure 4.  $R_{DS(ON)}$  vs.  $V_{GS}$

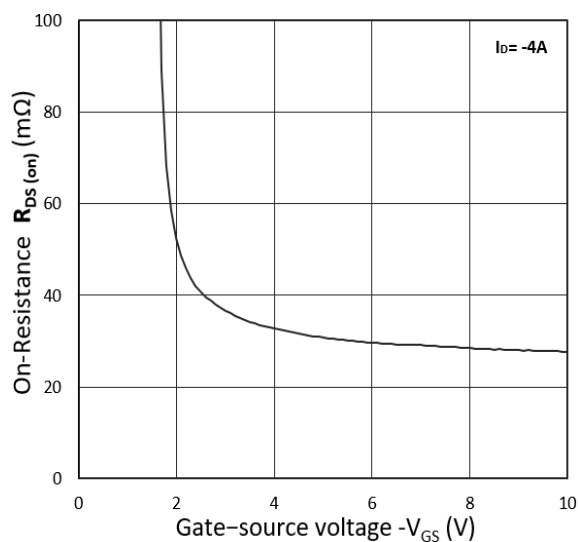


Figure 5.  $I_S$  vs.  $V_{SD}$

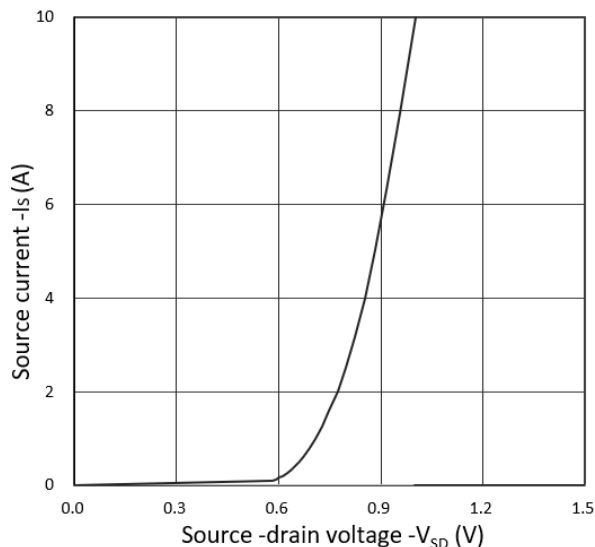


Figure 6. Threshold Voltage vs.  $T_J$

