
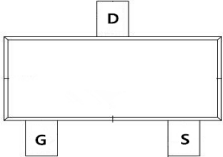




**TM04N10MI**

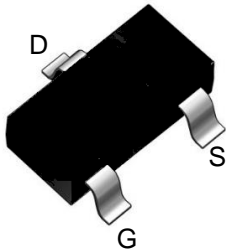
**N-Channel Enhancement Mosfet**

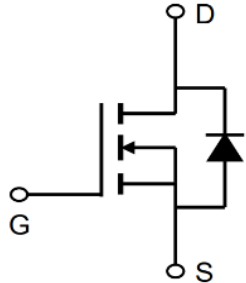
<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS} = 100V</math> <math>I_D = 4A</math></p> <p><math>R_{DS(ON)} = 110m\Omega</math> (typ.) @ <math>V_{GS}=10V</math></p> <p>100% UIS Tested 100% <math>R_g</math> Tested</p> 
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Marking:04N10R

MI:SOT-23-3L





Absolute Maximum Ratings (TC=25°C unless otherwise specified)				
Parameter		Symbol	Limit	Unit
Drain-source Voltage		$V_{DS}$	100	V
Gate-source Voltage		$V_{GS}$	±20	V
Drain Current	$T_A=25^\circ C$	$I_D$	4	A
	$T_A=70^\circ C$		3.1	
Pulsed Drain Current <sup>A</sup>		$I_{DM}$	21	A
Total Power Dissipation @ $T_A=25^\circ C$		$P_D$	1.2	W
Thermal Resistance Junction-to-Ambient <sup>B</sup>		$R_{\theta JA}$	104	°C/W
Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~+150	°C



## TM04N10MI

## N-Channel Enhancement Mosfet

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	3.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=3.0A$		110	140	m $\Omega$
		$V_{GS}=4.5V, I_D=2.0A$		160	200	
Diode Forward Voltage	$V_{SD}$	$I_S=3.0A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	$I_S$				4.0	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		206		pF
Output Capacitance	$C_{oss}$			29		
Reverse Transfer Capacitance	$C_{rss}$			1.4		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=50V, I_D=3.0A$		4.3		nC
Gate-Source Charge	$Q_{gs}$			1.5		
Gate-Drain Charge	$Q_{gd}$			1.1		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=50V, I_D=3.0A, R_{GEN}=2\Omega$		14.7		ns
Turn-on Rise Time	$t_r$			3.5		
Turn-off Delay Time	$t_{D(off)}$			20.9		
Turn-off fall Time	$t_f$			2.7		
Reverse recovery time	$t_{rr}$	$I_S=3A, di/dt=100 A/\mu s$		32		ns
Reverse recovery charge	$Q_{rr}$			39		nC
Peak reverse recovery current	$I_{rm}$			2.1		A

A. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

B. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.



# TM04N10MI

# N-Channel Enhancement Mosfet

## Typical Performance Characteristics

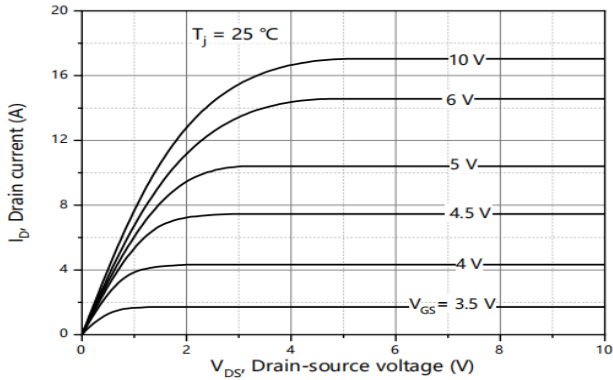


Figure1. Output Characteristics

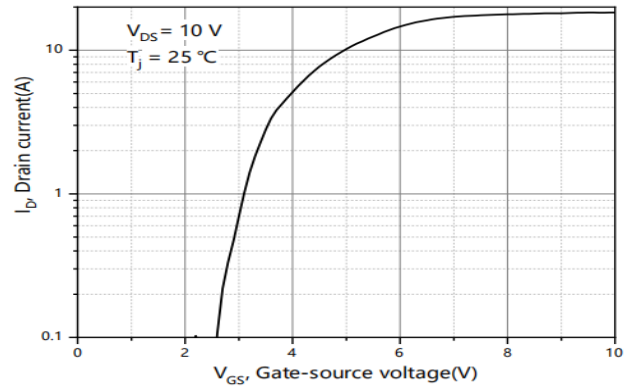


Figure2. Transfer Characteristics

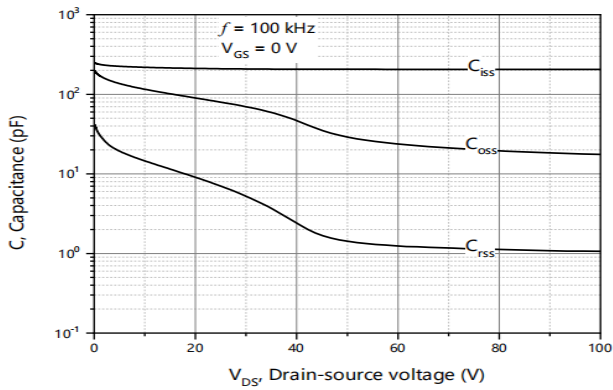


Figure3. Capacitance Characteristics

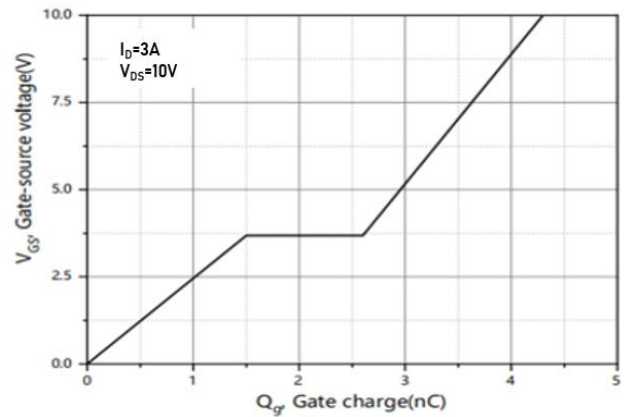


Figure4. Gate Charge

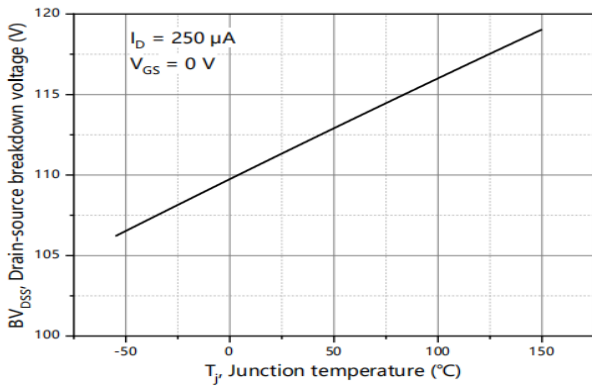


Figure5. Drain-Source breakdown voltage

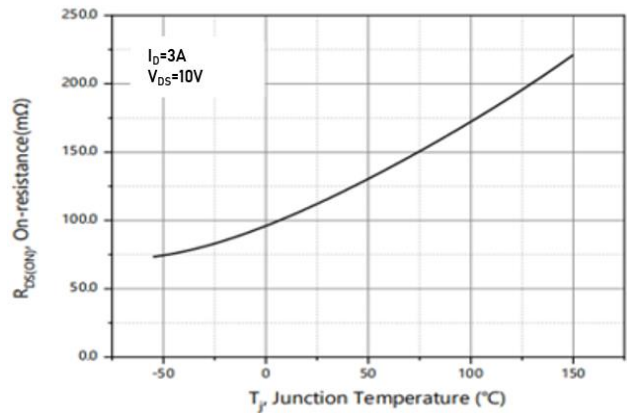


Figure6. Drain-Source on Resistance

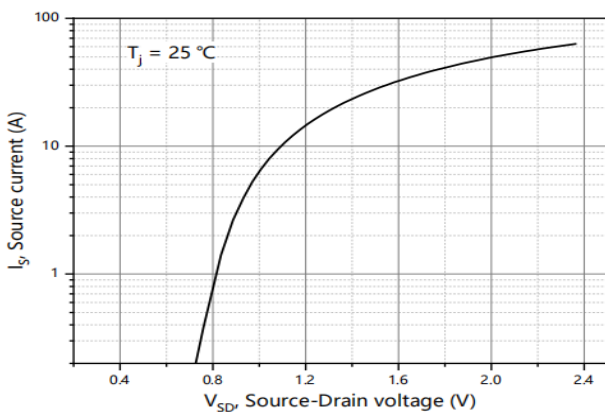


Figure7. Forward characteristic of body diode

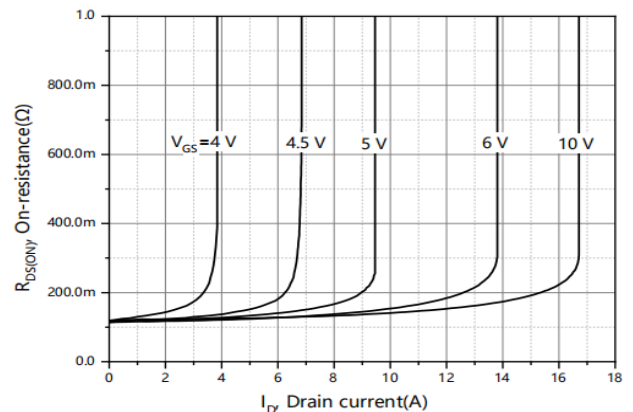


Figure8. Drain-source on-state resistance

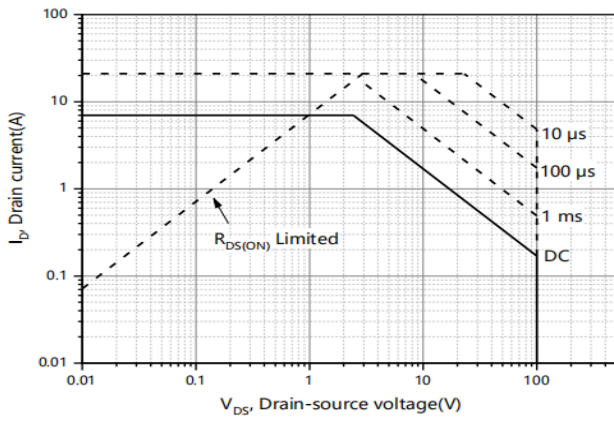


Figure9. Safe Operation Area  $T_A=25^\circ C$

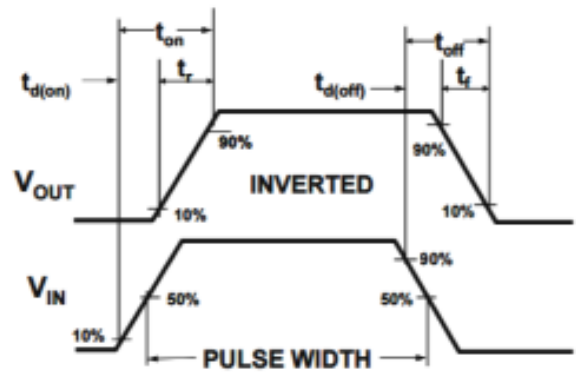
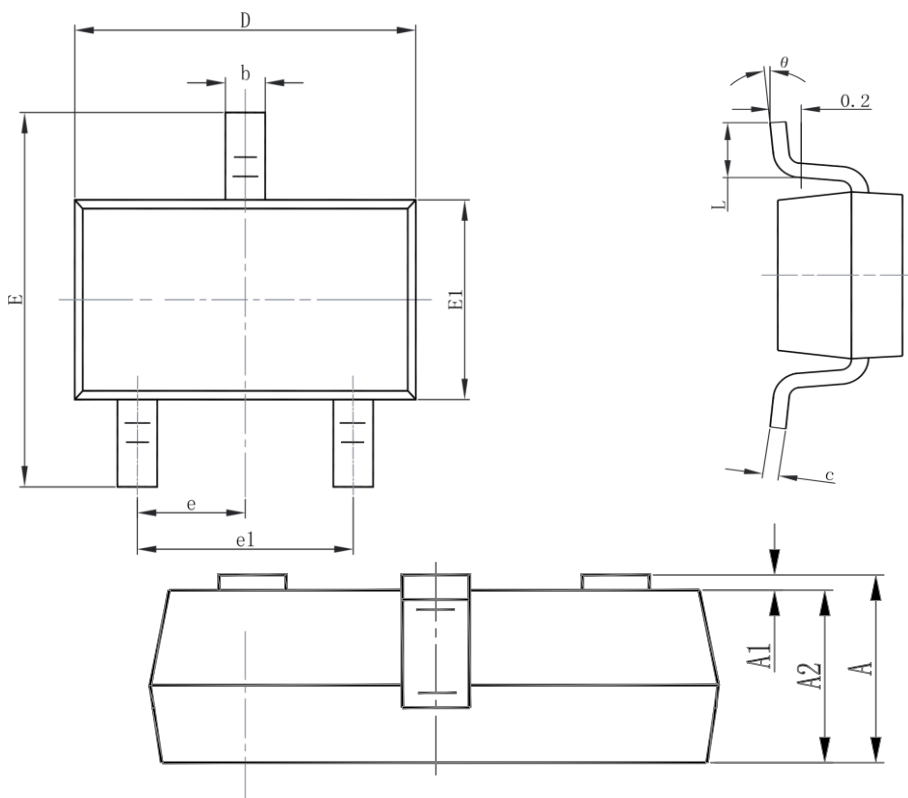


Figure10. Switching wave

## Package Information:SOT-23-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E1	1.500	1.700	0.059	0.067
E	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
$\theta$	0°	8°	0°	8°