


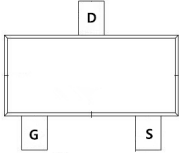
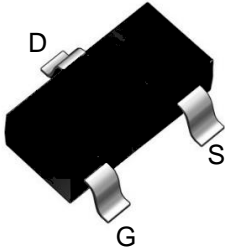
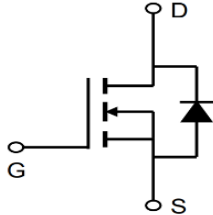


**TM05N10MI**

**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 = 5.0A</math></p> <p><math>R_{DS(ON)} = 105(\text{typ.})m\Omega @ V_{GS}=10V</math></p> <p>100% UIS Tested 100% <math>R_g</math> Tested</p> 
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MI:SOT-23-3L

Marking: 1005

Absolute Maximum Ratings (TC=25°C unless otherwise specified)			
Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D @ T_A=25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	5.0	A
$I_D @ T_A=70^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	4.4	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	26	A
$P_D @ T_A=25^\circ C$	Total Power Dissipation <sup>3</sup>	1.5	W
$T_{STG}$	Storage Temperature Range	-55 to 150	°C
$T_J$	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Thermal Resistance Junction-ambient(steady state) <sup>1</sup>	135	°C/W
	Thermal Resistance Junction-ambient( $t < 10s$ ) <sup>1</sup>	85	°C/W



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Electrical Characteristics@T<sub>j</sub>=25°C(unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	107	-	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.0	1.5	2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	V <sub>GS</sub> =10V, I <sub>D</sub> =10A	-	105	125	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =8A	-	125	135	mΩ
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	610	-	pF
C <sub>oss</sub>	Output Capacitance		-	40	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	25	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =30V, I <sub>D</sub> =10A, V <sub>GS</sub> =10V	-	12	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	2.2	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	2.5	-	nC
td(on)	Turn-on Delay Time	V <sub>DS</sub> =30V, I <sub>D</sub> =5A, R <sub>G</sub> =1.8Ω, V <sub>GS</sub> =10V	-	7	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	5	-	ns
td(off)	Turn-off Delay Time		-	16	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	6	-	ns
I <sub>S</sub>	Continuous Source Current <sup>1,5</sup>	V <sub>G</sub> =V <sub>D</sub> =0V , Force Current	-	-	10	A
I <sub>SM</sub>	Pulsed Source Current <sup>2,5</sup>		-	-	40	A
VSD	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =10A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =10A, dI/dt=100A/μs	-	21	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	21	-	nC

Note :

- 1.The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The EAS data shows Max. rating . The test condition is V<sub>DD</sub>=25V,V<sub>GS</sub>=10V,L=0.1mH,I<sub>AS</sub>=11A
- 4.The power dissipation is limited by 150°C junction temperature
- 5 .The data is theoretically the same as I<sub>D</sub> and I<sub>DM</sub> , in real applications , should be limited by total power dissipation.

Typical Characteristics

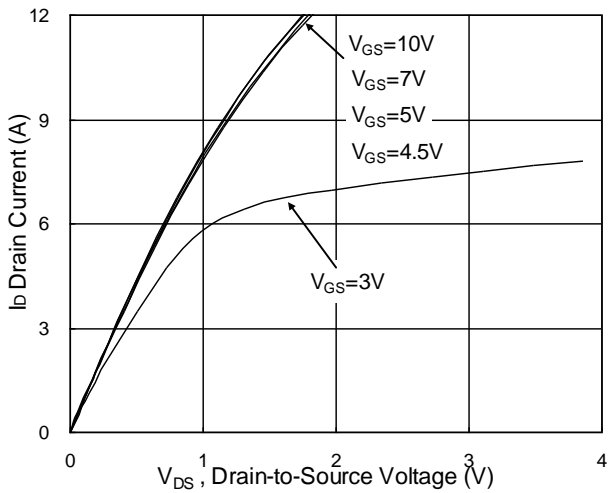


Fig.1 Typical Output Characteristics

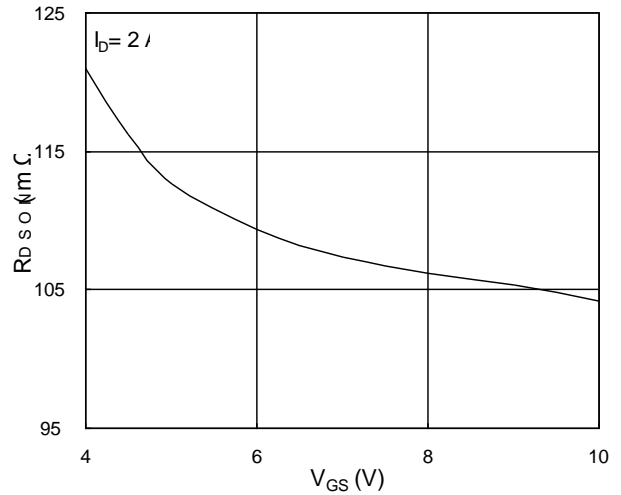


Fig.2 On-Resistance vs. Gate-Source

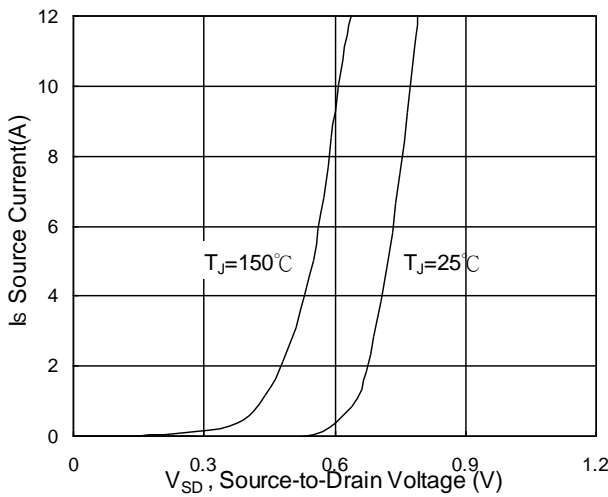


Fig.3 Forward Characteristics Of Reverse

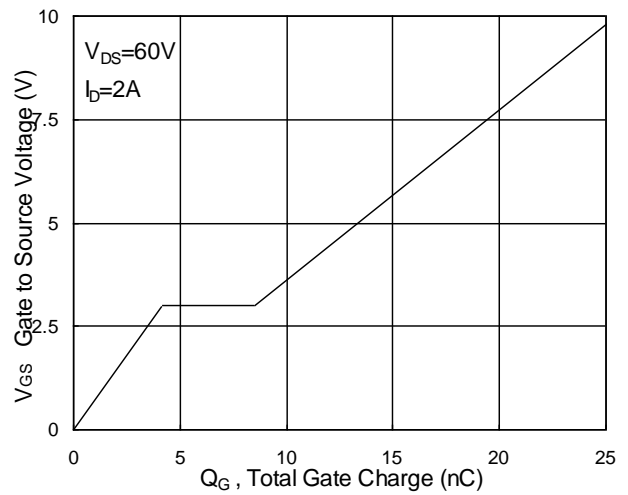


Fig.4 Gate-Charge Characteristics

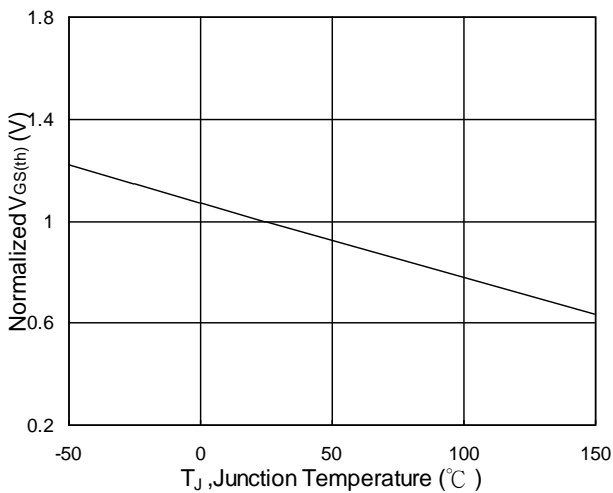


Fig.5 Normalized  $V_{GS(th)}$  vs.  $T_J$

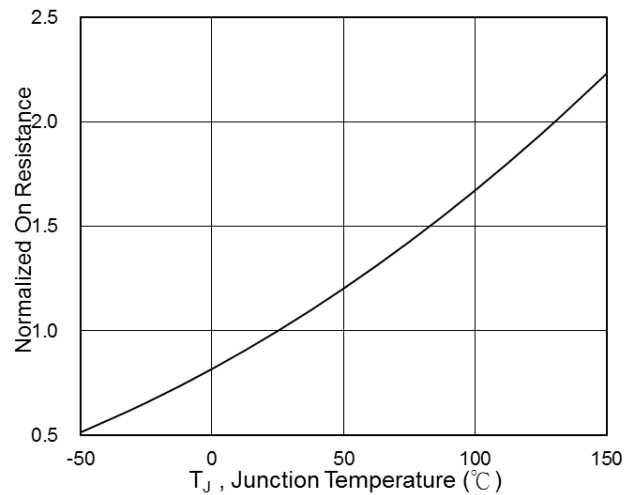


Fig.6 Normalized  $R_{DS(on)}$  vs.  $T_J$

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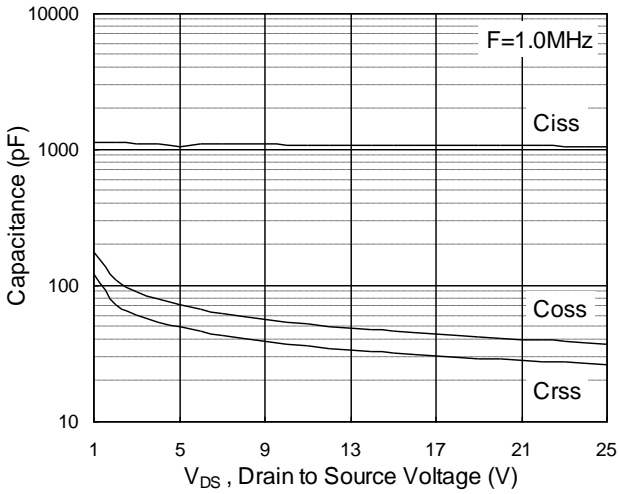


Fig.7 Capacitance

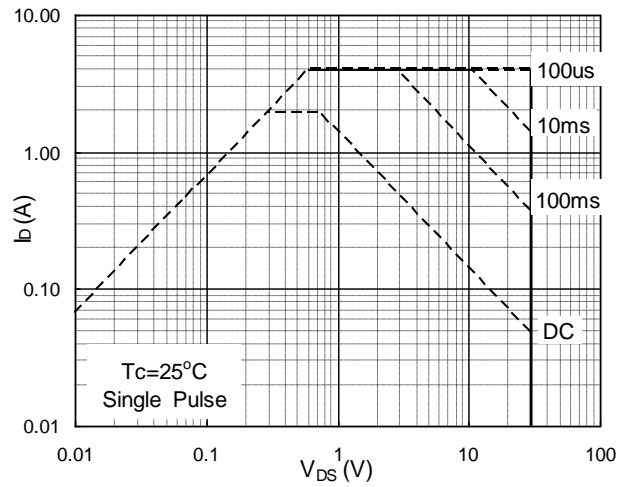


Fig.8 Safe Operating Area

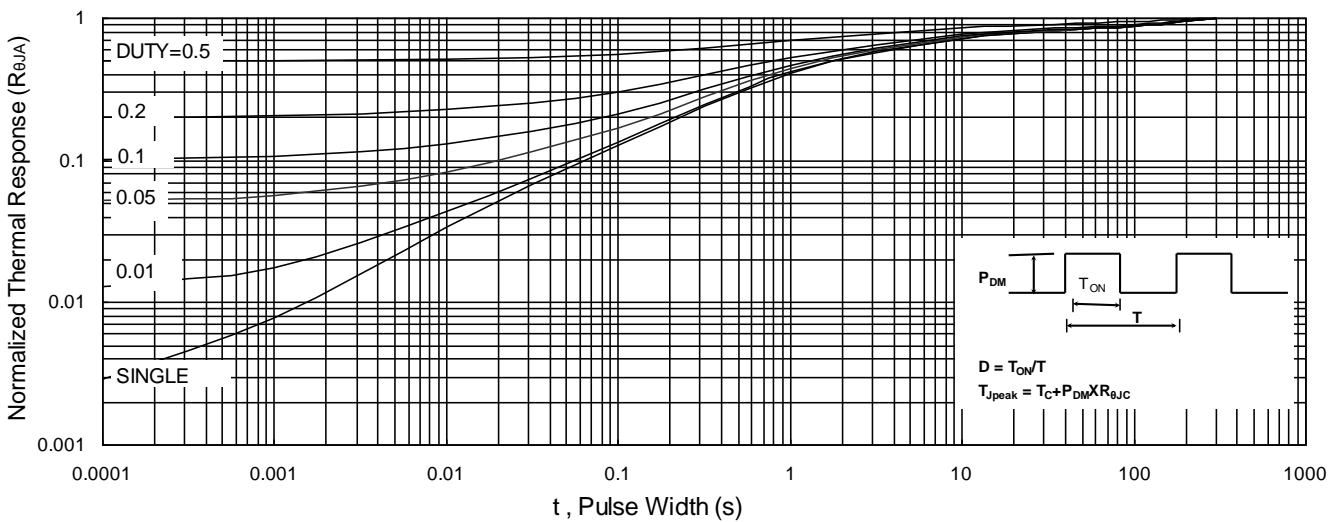


Fig.9 Normalized Maximum Transient Thermal Impedance

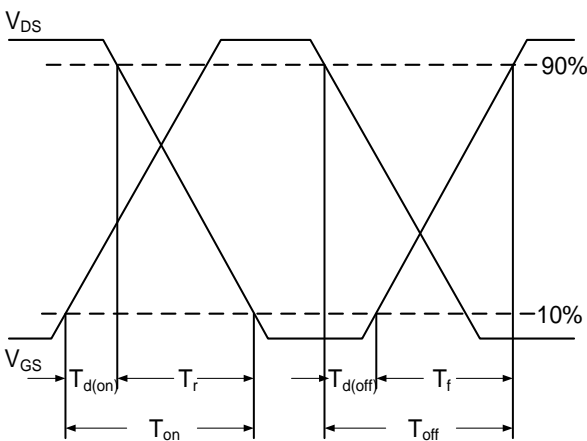


Fig.10 Switching Time Waveform

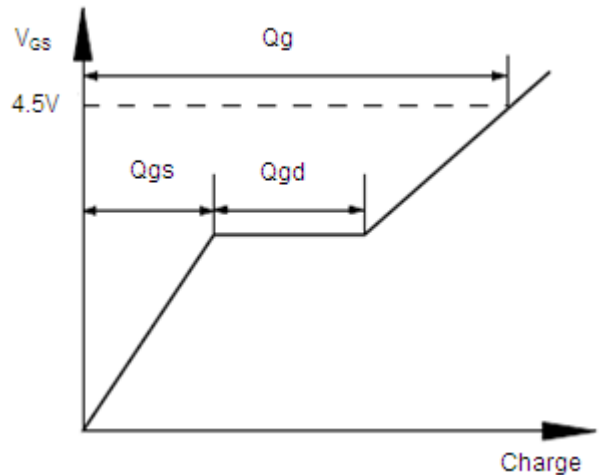
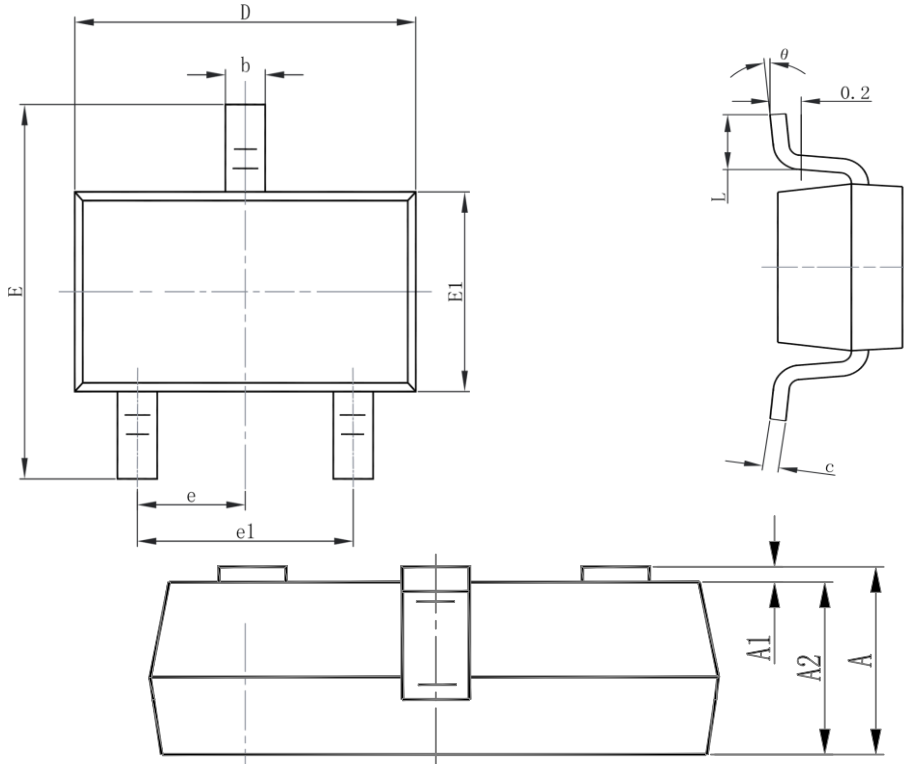


Fig.11 Gate Charge Waveform

## Package Mechanical Data: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
θ	0°	8°	0°	8°