TM03N10MI

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

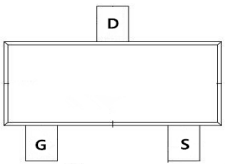
General Features

V_{DS} = 100V I_D =3.0A

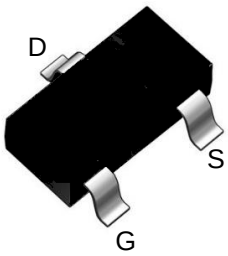
$R_{DS(ON)}$ = 200mΩ(typ.)@ V_{GS}=10V

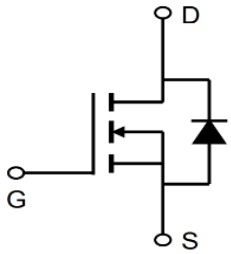
100% UIS Tested
100% R_g Tested

Green Product



MI:SOT-23-3L





Marking: 3N10 OR 1002

Absolute Maximum Ratings (TC=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	3	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	1.2	A
I_{DM}	Pulsed Drain Current[2]	5	A
P_D@T_A=25°C	Total Power Dissipation[3]	1	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	125	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	80	°C/W

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250μA	100	-	-	V
Gate Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Drain Cut-off Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V	-	-	1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = 250μA	1.1	1.5	2.5	V
Drain-Source on-state Resistance[3]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2A	-	200	230	mΩ
		V_{GS} = 4.5V, I_D = 1.5A	-	220	280	
Dynamic Characteristics[4]						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1MHz	-	440	-	pF
Output Capacitance	C_{oss}		-	14	-	
Reverse Transfer Capacitance	C_{rss}		-	10	-	
Switching Characteristics[4]						
Total gate charge	Q_g	V_{GS} = 10V, V_{DS} = 50V, I_D = 2A	-	5.3	-	nC
Gate-source charge	Q_{gs}		-	1.4	-	
Gate-drain charge	Q_{gd}		-	1.8	-	
Turn-on Time	$t_{d(on)}$	V_{GS} = 10V, V_{DD} = 50V, R_G = 1Ω, I_D = 2A	-	14	-	ns
Rise time	t_f		-	54	-	
Turn-off Time	$t_{d(off)}$		-	18	-	
Fall time	t_f		-	11	-	
Source-Drain Diode characteristics						
Body Diode Voltage[3]	V_{SD}	I_S= 1A, V_{GS} = 0V	-	-	1.2	V
Continuous Source Current	I_S		-	-	3.0	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C.
2. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.
4. This value is guaranteed by design hence it is not included in the production test.

Typical Characteristics

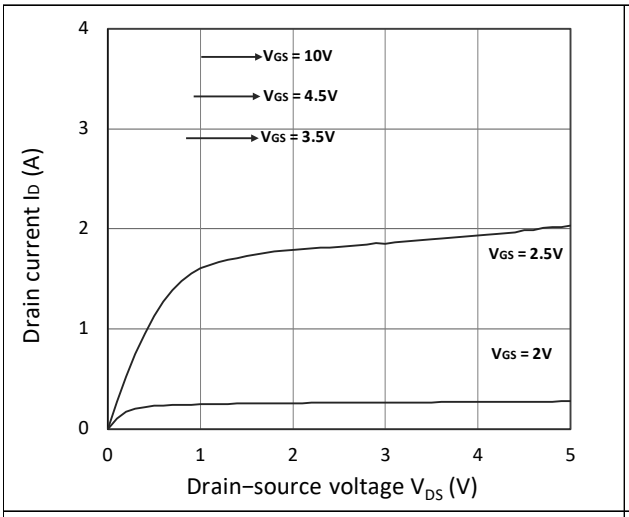


Figure 1. Output Characteristics

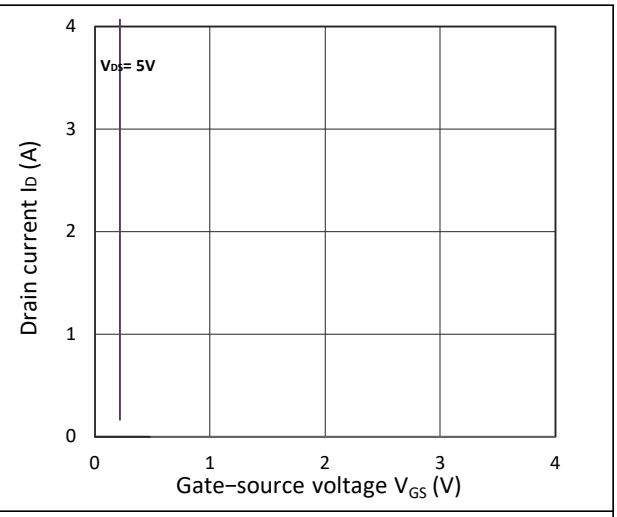


Figure 2. Transfer Characteristics

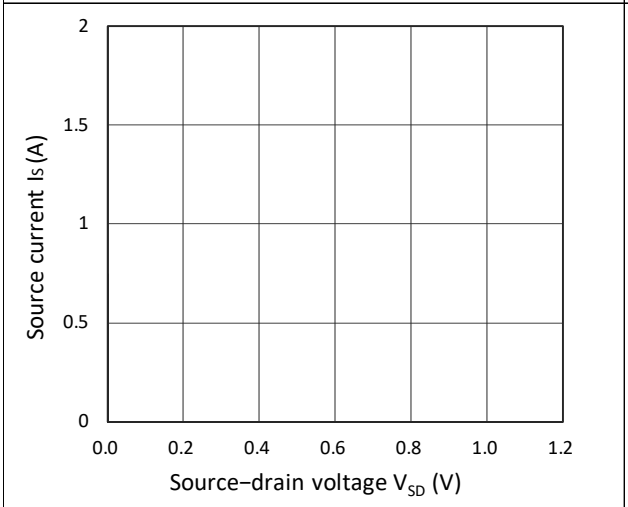


Figure 3. Forward Characteristics of Reverse

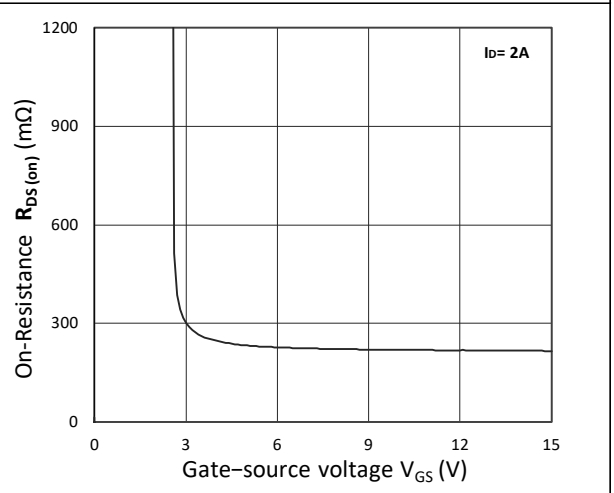


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

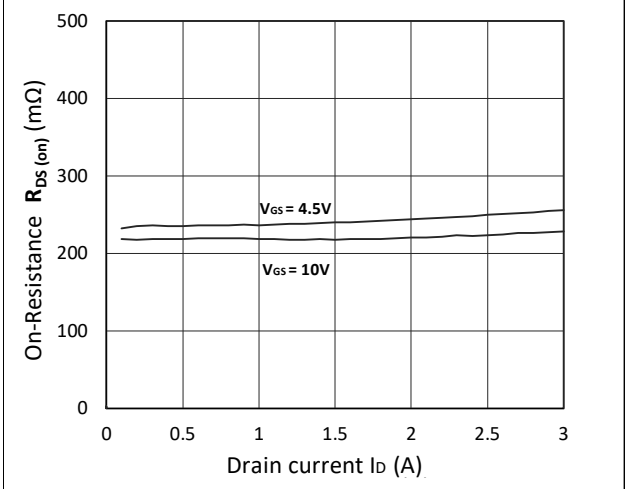


Figure 5. $R_{DS(ON)}$ vs. I_D

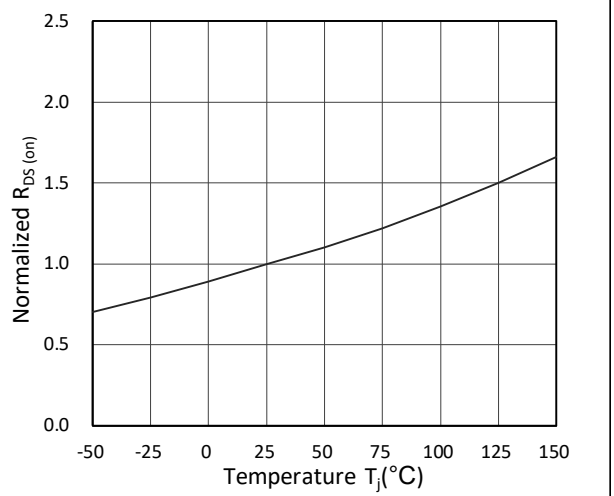


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

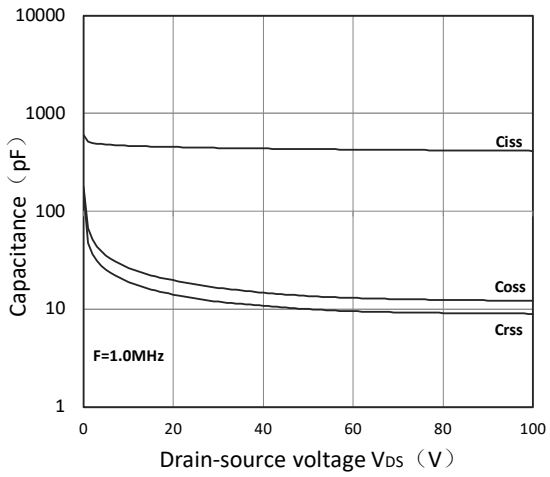


Figure 7. Capacitance Characteristics

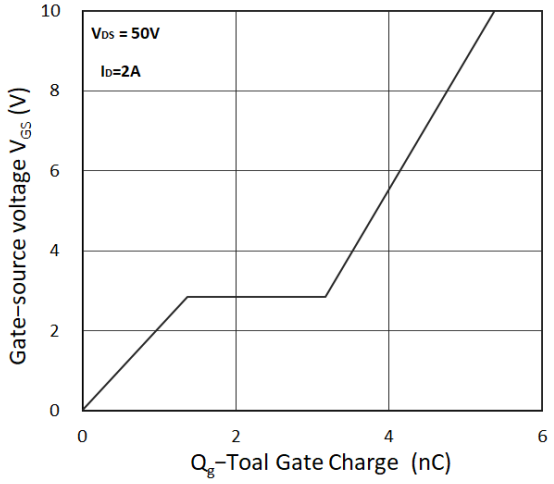
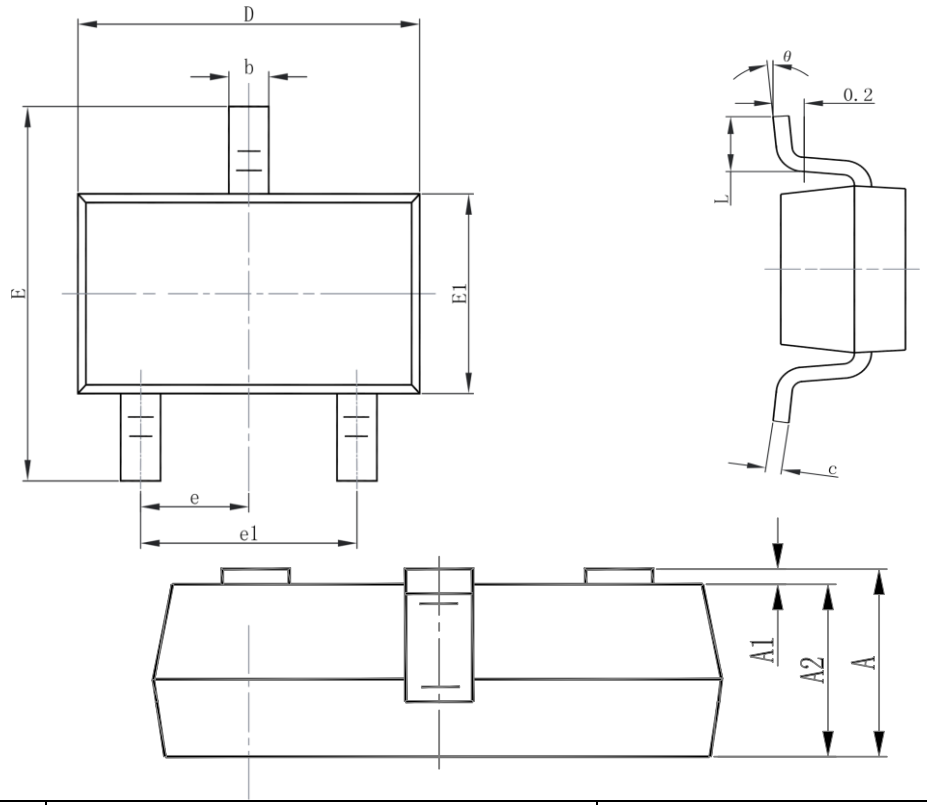


Figure 8. Gate Charge Characteristics

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
θ	0°	8°	0°	8°

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