

TM10N02S

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

$V_{DS} = 20V$ $I_D = 10A$

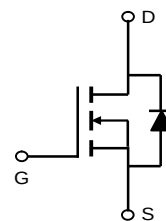
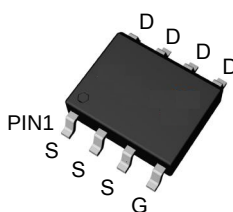
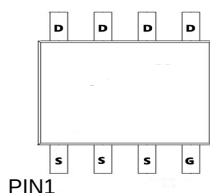
$R_{DS(ON)} = 12m\ \Omega$ (typ.) @ $V_{GS} = 4.5V$

100% UIS Tested

100% R_g Tested



S:SOP-8L



Marking:10N02 OR 2010

Absolute Maximum Rating ($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	± 12	V
Continuous Drain Current	$T_A = 25^\circ C$	I_D	10	A
Pulsed Drain Current ¹		I_{DM}	26	A
Power Dissipation	$T_A = 25^\circ C$	P_D	2.25	W
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient ²	$R_{\theta JA}$	90	$^\circ C/W$

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

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _D = 250μA	20	-	-	V
Gate Leakage Current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0 V	-	-	±100	nA
Drain Cut-off Current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0 V	-	-	1	μA
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D = 250μA	0.45	0.7	1	V
Drain-Source On-State Resistance ³	R _{DS(on)}	V _{GS} = 4.5V, I _D =5A	-	12	15	mΩ
		V _{GS} = 2.5V, I _D = 4.7A	-	17	21	
		V _{GS} = 1.8V, I _D = 4.3A	-	28	50	
Dynamic Characteristics ⁴						
Input Capacitance	C _{iss}	V _{GS} = 0V, V _{DS} = 10V, f = 1MHz	-	700	-	pF
Output Capacitance	C _{oss}		-	120	-	
Reverse Transfer Capacitance	C _{rss}		-	105	-	
Switching Characteristics ⁴						
Total Gate Charge	Q _g	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 5A	-	10.5	-	nC
Gate-Source Charge	Q _{gs}		-	2	-	
Gate-Drain Charge	Q _{gd}		-	2.5	-	
Turn-On Time	t _{d(on)}	V _{GEN} = 5V, V _{DD} = 10V, I _D = 5A,R _G = 3Ω,	-	10	-	ns
Rise Time	t _r		-	20	-	
Turn-Off Time	t _{d(off)}		-	32	-	
Fall Time	t _f		-	12	-	
Source-Drain Diode Characteristics						
Body Diode Voltage ³	V _{SD}	I _S =4A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	I _S		-	-	10	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 20Z 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

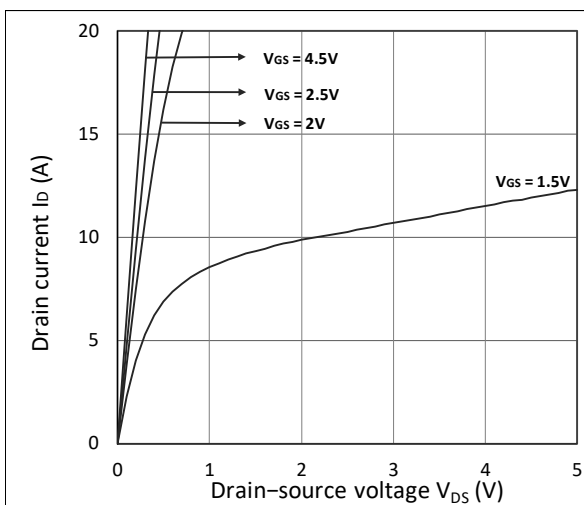


Figure 1. Output Characteristics

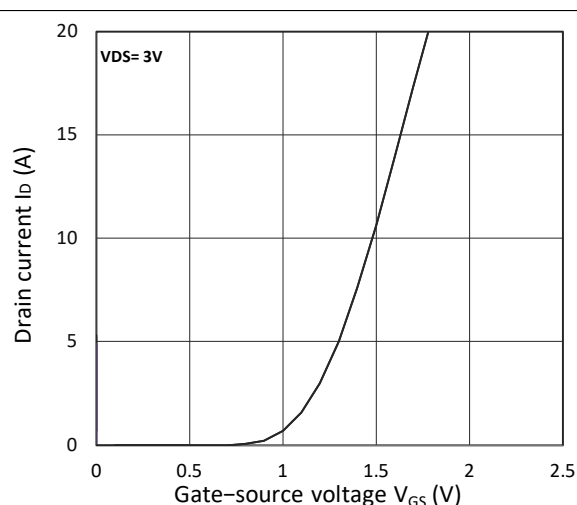


Figure 2. Transfer Characteristics

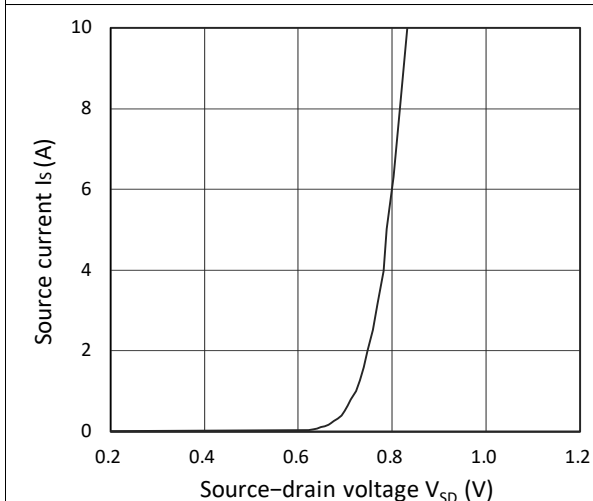


Figure 3. Forward Characteristics of Reverse

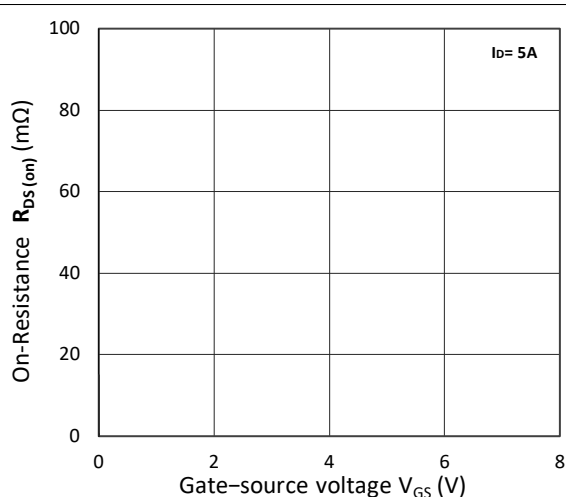


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

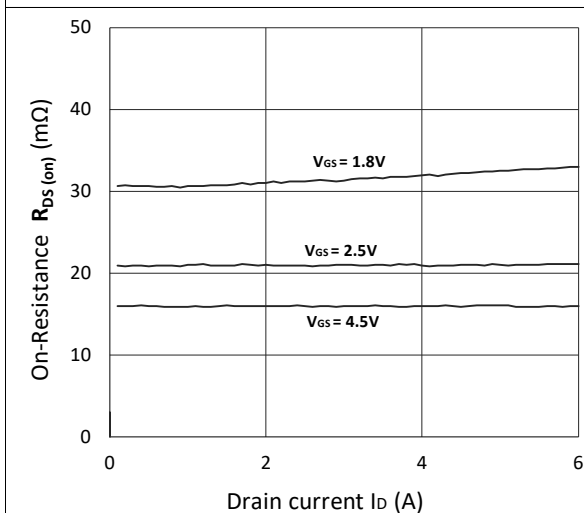


Figure 5. $R_{DS(ON)}$ vs. I_D

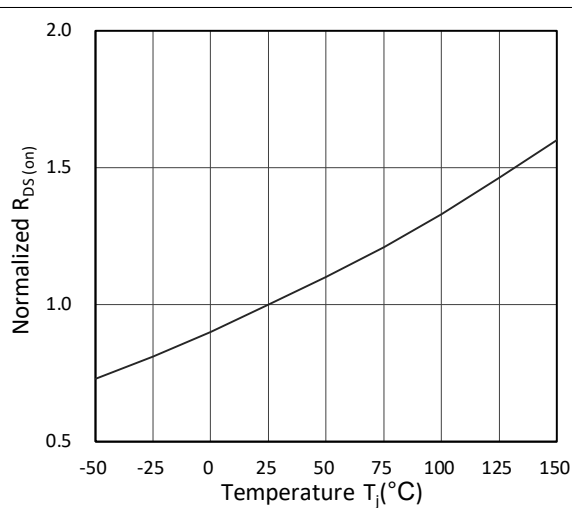


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

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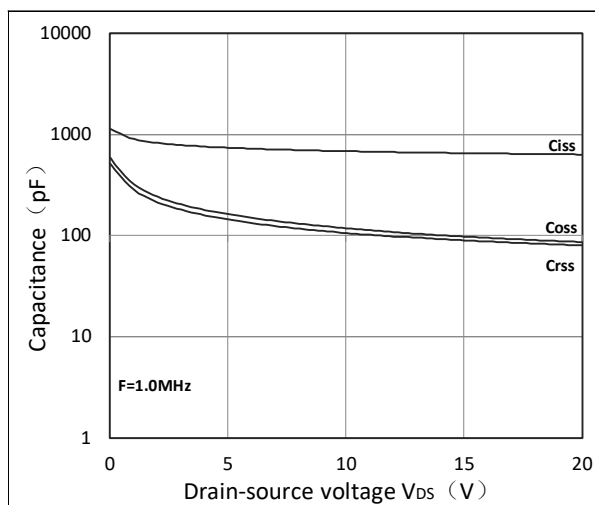


Figure 7. Capacitance Characteristics

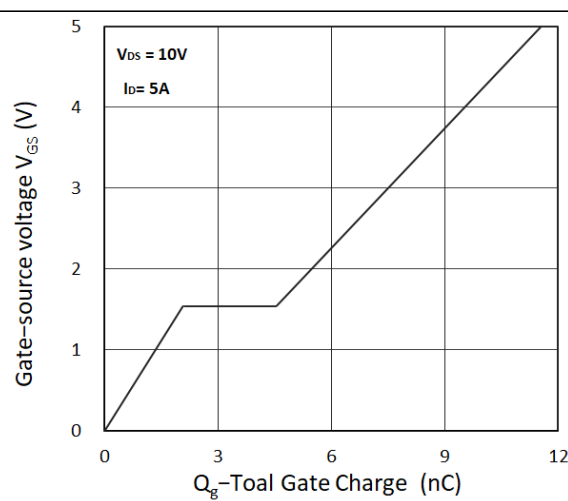
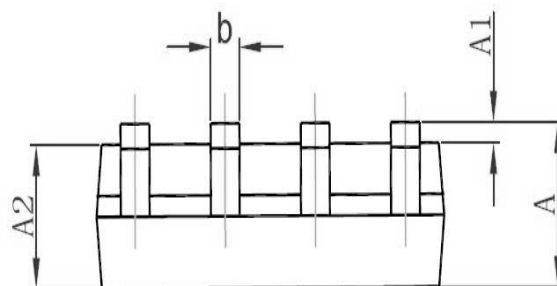
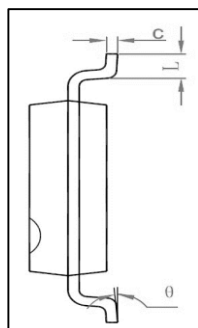
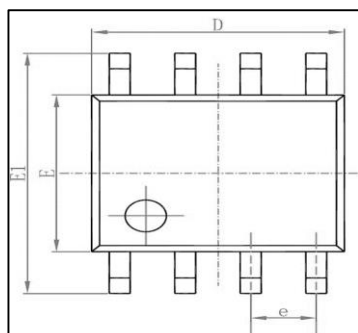
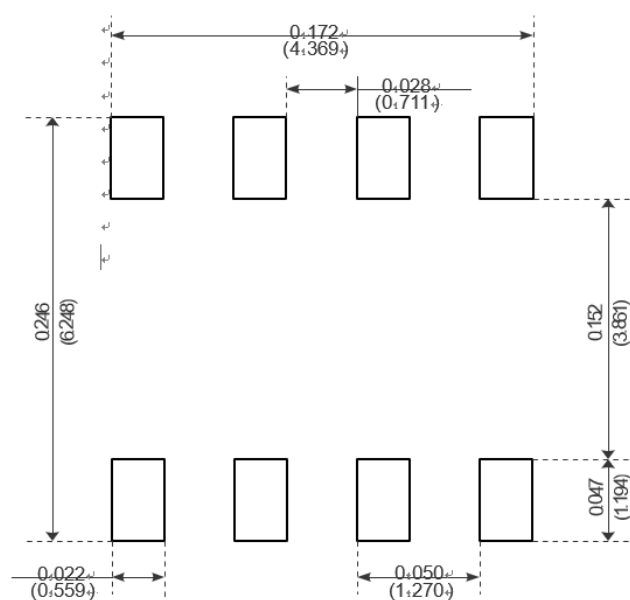


Figure 8. Gate Charge Characteristics

Package Mechanical Data:SOP-8L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270 (BSC)		0.050 (BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Recommended Minimum Pads