

# MT10N18S

## N-Channel 100V Power MOSFET

### Features

- Typ  $R_{DS(on)}=17m\Omega(\text{typ}) @ V_{GS}=10V, I_D=20A$
- Fast Switching Speed
- Low Gate Charge
- High Power and Current Handling Capability

### General Description

This N-Channel MOSFET is produced using MOS-TECH Semiconductor's advanced PowerTrench process that has been especially tailored to minimize the on-state resistance and yet maintain superior switching performance.

### Applications

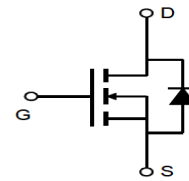
- DC-DC primary bridge
- DC-DC Synchronous rectification
- DC FAN



**MT Semiconductor®**

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### Simplified Schematic



### MARKING DIAGRAM & PIN ASSIGNMENT



### Absolute Maximum Ratings (@ $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Units	
$V_{DS}$	Drain-to-Source Voltage	100	V	
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V	
$I_D$	Continuous Drain Current	$T_C = 25^\circ\text{C}$	40	A
		$T_C = 100^\circ\text{C}$	24	
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	160	A	
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	121	mJ	
$P_D$	Power Dissipation	$T_C = 25^\circ\text{C}$	62.5	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2	$^\circ\text{C}/\text{W}$	
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ\text{C}$	

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$I_D = 250\text{ mA}, V_{GS} = 0\text{V}$	100	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 100\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	$\mu\text{A}$
$I_{GSS}$	Gate-Body Leakage Current	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	-	-	$\pm 100$	$\mu\text{A}$
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ mA}$	1.2	1.7	2.5	V
$R_{DS(ON)}$	Static Drain-Source ON-Resistance <sup>(3)</sup>	$V_{GS} = 10\text{V}, I_D = 20\text{A}$	-	17.0	22.0	m $\Omega$
		$V_{GS} = 4.5\text{V}, I_D = 10\text{A}$	-	18.0	24.0	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V},$ $f = 1\text{MHz}$	-	5060	-	pF
$C_{oss}$	Output Capacitance		-	175	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	155	-	pF
$Q_g$	Total Gate Charge	$V_{GS} = 0\text{ to }10\text{V}$ $V_{DS} = 50\text{V}, I_D = 20\text{A}$	-	101	-	nC
$Q_{gs}$	Gate Source Charge		-	26	-	nC
$Q_{gd}$	Gate Drain("Miller") Charge		-	24	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 10\text{V}, V_{DD} = 50\text{V}$ $I_D = 20\text{A}, R_{GEN} = 2.5\text{ }\Omega$	-	20	-	ns
$t_r$	Turn-On Rise Time		-	24	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	45	-	ns
$t_f$	Turn-Off Fall Time		-	15	-	ns
<b>Drain-Source Diode Characteristics and Max Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	40	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	160	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0\text{V}, I_S = 30\text{A}$	-	-	1.2	V
$t_{rr}$	Body Diode Reverse Recovery Time	$I_F = 15\text{A}, di/dt = 100\text{A}/\mu\text{s}$	-	40	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Charge		-	63	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2.  $E_{AS}$  condition: Starting  $T_J = 25^\circ\text{C}$ ,  $V_{DD} = 50\text{V}$ ,  $V_G = 10\text{V}$ ,  $R_G = 25\text{ohm}$ ,  $L = 0.5\text{mH}$ ,  $I_{AS} = 22\text{A}$
  3. Pulse Test: Pulse Width 0.300 $\mu\text{s}$ , Duty Cycle 0.0.5%.

7HM&LFXLW

) L X U H \* D M & K D U H 7 H M & L F X L W : D Y H R U P

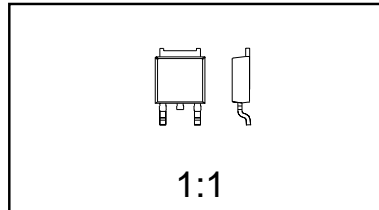
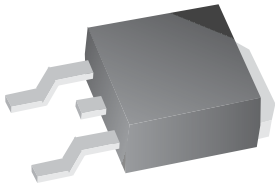
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) L X U H 8 Q F O P S H G , Q G X F M Y H 6 Z L W K L Q J 7 H M & L F X L W : D Y H R U P

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Package Dimensions

TO-252-2L

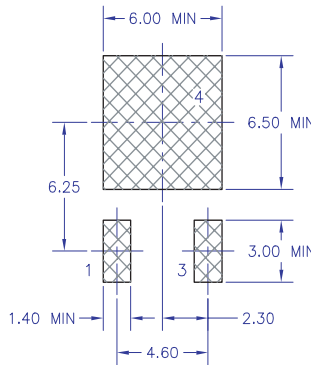
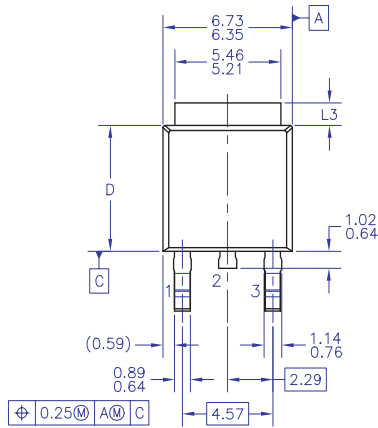


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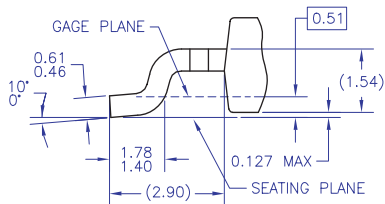
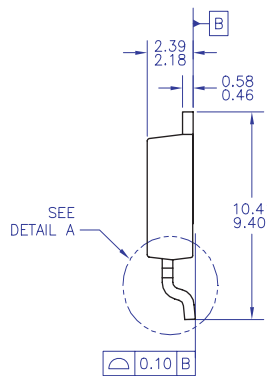
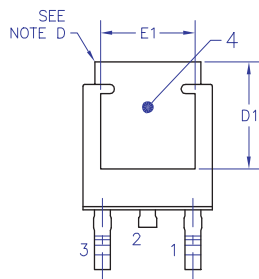
Scale 1:1 on letter size paper

Dimensions shown below are in:  
millimeters

Part Weight per unit (gram): 0.33



LAND PATTERN RECOMMENDATION



DETAIL A  
(ROTATED -90°)  
SCALE: 12X

NOTES: UNLESS OTHERWISE SPECIFIED

- A) ALL DIMENSIONS ARE IN MILLIMETERS.
- B) THIS PACKAGE CONFORMS TO JEDEC, TO-252, ISSUE C, VARIATION AA & AB, DATED NOV. 1999.
- C) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
- D) HEAT SINK TOP EDGE COULD BE IN CHAMFERED CORNERS OR EDGE PROTRUSION.
- E) DIMENSIONS L3,D,E1&D1 TABLE:

	OPTION AA	OPTION AB
L3	0.89-1.27	1.52-2.03
D	5.97-6.22	5.33-5.59
E1	4.32 MIN	3.81 MIN
D1	5.21 MIN	4.57 MIN

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