

NTMS4118N

Product Preview

Power MOSFET

30 V, 14.8 A, Single N-Channel, SO-8

Features

- Low $R_{DS(on)}$
- Fast Switching Times
- Pb-Free Package is Available

Applications

- Notebooks, Graphics Cards
- Low Side Switch
- DC-DC

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V _{DSS}	30	V
Gate-to-Source Voltage			V _{GS}	± 20	V
Continuous Drain Current (Note 1)	Steady State	T _A = 25°C	I _D	12.3	A
		T _A = 85°C		8.8	
	t ≤ 10 s	T _A = 25°C		14.8	
Power Dissipation (Note 1)	Steady State	T _A = 25°C	P _D	1.5	W
	t ≤ 10 s			2.2	
Continuous Drain Current (Note 2)	Steady State	T _A = 25°C	I _D	9.1	A
		T _A = 85°C		6.6	
Power Dissipation (Note 2)	Steady State	T _A = 25°C	P _D	0.9	W
Pulsed Drain Current	tp = 10 μs		I _{DM}	44	A
Operating Junction and Storage Temperature			T _J , T _{stg}	-55 to 150	°C
Source Current (Body Diode)			I _S	2.8	A
Single Pulse Drain-to-Source Avalanche Energy			E _{AS}	TBD	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			T _L	260	°C

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Ambient - Steady State (Note 1)	$R_{\theta JA}$	81.5	$^\circ\text{C/W}$
Junction-to-Ambient - $t \leq 10\text{ s}$ (Note 1)	$R_{\theta JA}$	56	
Junction-to-Ambient - Steady State (Note 2)	$R_{\theta JA}$	146.5	

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

1. Surface mounted on FR4 board using 1 in sq pad size (Cu area 1.127 in sq [1 oz] including traces).
2. Surface mounted on FR4 board using the minimum recommended pad size (Cu area = TBD in sq).

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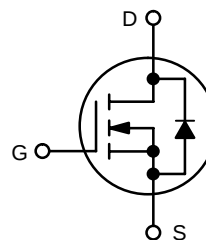


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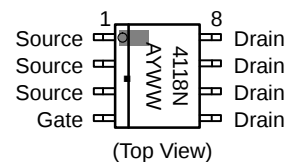
$V_{(BR)DS}$	$R_{DS(on)}$ TYP	I_D MAX (Note 1)
30 V	4.6 m Ω @ 10 V	14.8 A
	6.5 m Ω @ 4.5 V	



MARKING DIAGRAM/ PIN ASSIGNMENT



SO-8
CASE 751
STYLE 12



4118N = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb-Free Package

ORDERING INFORMATION

Device	Package	Shipping†
NTMS4118NR2	SO-8	2500/Tape & Reel
NTMS4118NR2G	SO-8 (Pb-Free)	2500/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

NTMS4118N

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$			TBD		mV/ $^\circ\text{C}$
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = 24\text{ V}$	$T_J = 25^\circ\text{C}$		1.0	μA
			$T_J = 125^\circ\text{C}$		10	
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA

ON CHARACTERISTICS (Note 3)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\text{ }\mu\text{A}$	1.5		2.5	V
Negative Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$			TBD		mV/ $^\circ\text{C}$
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 12.3\text{ A}$		4.6	6.0	m Ω
		$V_{GS} = 4.5\text{ V}, I_D = 10.3\text{ A}$		6.5	8.5	
Forward Transconductance	g_{FS}	$V_{DS} = 15\text{ V}, I_D = 10\text{ A}$		1.5		S

CHARGES, CAPACITANCES AND GATE RESISTANCE

Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = 24\text{ V}$		3600		μF
Output Capacitance	C_{OSS}			550		
Reverse Transfer Capacitance	C_{RSS}			320		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 24\text{ V}, I_D = 10.3\text{ A}$		32	35	nC
Threshold Gate Charge	$Q_{G(TH)}$			3.8		
Gate-to-Source Charge	Q_{GS}			11		
Gate-to-Drain Charge	Q_{GD}			15.2		
Gate Resistance	R_G			1.2		Ω

SWITCHING CHARACTERISTICS, $V_{GS} = 4.5\text{ V}$ (Note 4)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 15\text{ V}, I_D = 1.0\text{ A}, R_G = 6.0\text{ }\Omega$		29.6		ns
Rise Time	t_r			30.4		
Turn-Off Delay Time	$t_{d(OFF)}$			37.6		
Fall Time	t_f			26.7		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 2.8\text{ A}$	$T_J = 25^\circ\text{C}$		0.8	1.0	V
			$T_J = 125^\circ\text{C}$		TBD		
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{ V}, di_S/dt = 100\text{ A}/\mu\text{s}, I_S = 2.8\text{ A}$		33.2			ns
Charge Time	t_a			17			
Discharge Time	t_b			16			
Reverse Recovery Charge	Q_{RR}			0.0335			nC

3. Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$.

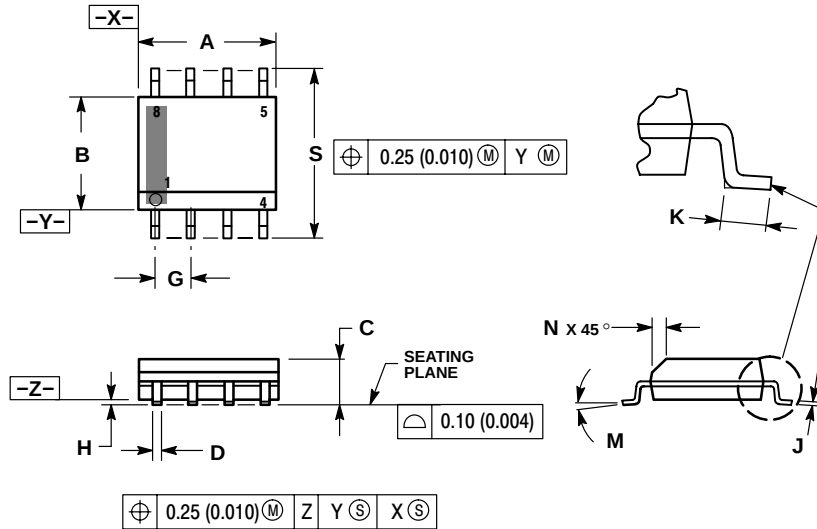
4. Switching characteristics are independent of operating junction temperatures.

NTMS4118N

PACKAGE DIMENSIONS

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SO-8
CASE 751-07
ISSUE AF



NOTES:

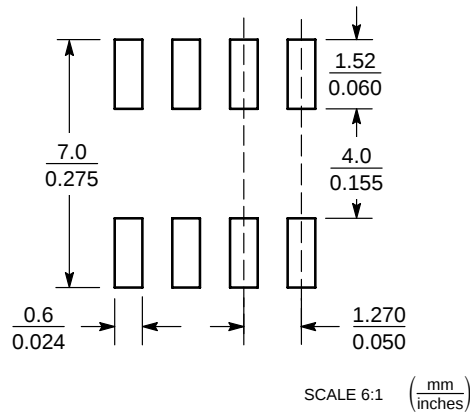
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

STYLE 12:

- PIN 1. SOURCE
- SOURCE
- SOURCE
- GATE
- DRAIN
- DRAIN
- DRAIN
- DRAIN

SOLDERING FOOTPRINT*



*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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