

# MOSFET - Power, Single N-Channel, SO8-FL

## 30 V, 0.55 mΩ, 462 A



ON Semiconductor®

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## Product Preview

### NTMFS0D5N03C

#### Features

- Advanced Package (5x6mm) with Excellent Thermal Conduction
- Ultra Low  $R_{DS(on)}$  to Improve System Efficiency
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

#### Applications

- ORing
- Motor Drive
- Power Load Switch
- DC-DC Converters
- Battery Management and Protection

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

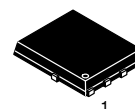
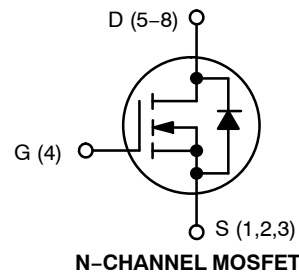
Parameter		Symbol	Value	Unit	
Drain-to-Source Voltage		$V_{DSS}$	30	V	
Gate-to-Source Voltage		$V_{GS}$	$\pm 20$	V	
Continuous Drain Current $R_{\theta JC}$ (Note 2)	Steady State	$T_C = 25^\circ\text{C}$	$I_D$	462	A
		$T_C = 100^\circ\text{C}$		326	
Power Dissipation $R_{\theta JC}$ (Note 2)		$T_C = 25^\circ\text{C}$	$P_D$	187	W
Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2)	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	67	A
		$T_A = 100^\circ\text{C}$		45	
Power Dissipation $R_{\theta JA}$ (Notes 1, 2)		$T_A = 25^\circ\text{C}$	$P_D$	3.9	W
Pulsed Drain Current	$T_A = 25^\circ\text{C}, t_p = 10 \mu\text{s}$	$I_{DM}$	900	A	
Single Pulse Drain-to-Source Avalanche Energy ( $I_L = \text{TBD } A_{pk}, L = 0.1 \text{ mH}$ )		$E_{AS}$	TBD	mJ	
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55 to +175	$^\circ\text{C}$	
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)		$T_L$	260	$^\circ\text{C}$	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Surface-mounted on FR4 board using 1 in<sup>2</sup> pad, 2 oz Cu pad.
2. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

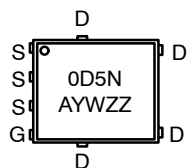
This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

$V_{(BR)DSS}$	$R_{DS(ON) MAX}$	$I_D MAX$
30 V	0.55 mΩ @ 10 V	462 A
	0.75 mΩ @ 4.5 V	



SO-8 FLAT LEAD CASE 488AA STYLE 1

#### MARKING DIAGRAMS



- A = Assembly Location
- Y = Year
- W = Work Week
- ZZ = Lot Traceability

#### ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 3 of this data sheet.

# NTMFS0D5N03C

## THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case – Steady State (Note 1)	$R_{\theta JC}$	0.8	°C/W
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	38	
Junction-to-Ambient – Steady State (Note 2)	$R_{\theta JA}$	134	°C/W

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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### OFF CHARACTERISTICS

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

### ON CHARACTERISTICS (Note 3)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 330\ \mu\text{A}$	1.3		2.2	V
Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$	$I_D = 330\ \mu\text{A}$ , ref to $25^\circ\text{C}$		TBD		mV/°C
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		0.45	0.55	m $\Omega$
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 30\text{ A}$		0.60	0.75	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = 3\text{ V}, I_D = 30\text{ A}$		TBD		S
Gate Resistance	$R_G$	$T_A = 25^\circ\text{C}$		0.2		$\Omega$

### CHARGES AND CAPACITANCES

Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{ V}, V_{DS} = 15\text{ V}, f = 1\text{ MHz}$		12800		pF
Output Capacitance	$C_{OSS}$			7500		
Reverse Transfer Capacitance	$C_{RSS}$			320		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 10\text{ V}, V_{DS} = 15\text{ V}; I_D = 30\text{ A}$		195		nC
Threshold Gate Charge	$Q_{G(TH)}$			TBD		
Gate-to-Drain Charge	$Q_{GD}$			16		
Gate-to-Source Charge	$Q_{GS}$			37		

### SWITCHING CHARACTERISTICS (Note 4)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 10\text{ V}, V_{DS} = 15\text{ V}, I_D = 30\text{ A}, R_G = 3.0\ \Omega$		TBD		ns
Rise Time	$t_r$			TBD		
Turn-Off Delay Time	$t_{d(OFF)}$			TBD		
Fall Time	$t_f$			TBD		

### DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	$V_{SD}$	$V_{GS} = 0\text{ V}, I_S = 30\text{ A}$	$T_J = 25^\circ\text{C}$		0.75	1.2	V
			$T_J = 125^\circ\text{C}$		TBD		
Reverse Recovery Time	$t_{RR}$	$V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}, V_{DS} = 15\text{ V}, I_S = 30\text{ A}$		TBD		ns	
Reverse Recovery Charge	$Q_{RR}$			TBD		nC	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

4. Switching characteristics are independent of operating junction temperatures.

# NTMFS0D5N03C

## DEVICE ORDERING INFORMATION

Device	Marking	Package	Shipping†
NTMFS0D5N03CT1G	0D5N	DFN5 (Pb-Free)	1500 / 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.

