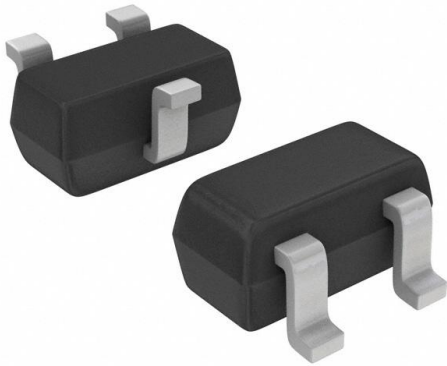


# NTA4001NT1 Datasheet

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<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	NTA4001NT1-DG
Manufacturer	<a href="#">onsemi</a>
Manufacturer Product Number	NTA4001NT1
Description	MOSFET N-CH 20V 238MA SC75
Detailed Description	N-Channel 20 V 238mA (Tj) 300mW (Tj) Surface Mount SC-75, SOT-416



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

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## Purchase and inquiry

Manufacturer Product Number:

NTA4001NT1

Series:

-

FET Type:

N-Channel

Drain to Source Voltage (Vdss):

20 V

Drive Voltage (Max Rds On, Min Rds On):

2.5V, 4.5V

Vgs(th) (Max) @ Id:

1.5V @ 100µA

Input Capacitance (Ciss) (Max) @ Vds:

20 pF @ 5 V

Power Dissipation (Max):

300mW (Tj)

Mounting Type:

Surface Mount

Package / Case:

SC-75, SOT-416

Manufacturer:

onsemi

Product Status:

Obsolete

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

238mA (Tj)

Rds On (Max) @ Id, Vgs:

30hm @ 10mA, 4.5V

Vgs (Max):

±10V

FET Feature:

-

Operating Temperature:

-55°C ~ 150°C (Tj)

Supplier Device Package:

SC-75, SOT-416

Base Product Number:

NTA40

## Environmental & Export classification

RoHS Status:

RoHS non-compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.21.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

# NTA4001N, NVA4001N

## MOSFET – Single, N-Channel, Gate ESD Protection, Small Signal, SC-75

### 20 V, 238 mA

#### Features

- Low Gate Charge for Fast Switching
- Small 1.6 x 1.6 mm Footprint
- ESD Protected Gate
- AEC-Q101 Qualified and PPAP Capable – NVA4001N
- These Devices are Pb-Free and are RoHS Compliant

#### Applications

- Power Management Load Switch
- Level Shift
- Portable Applications such as Cell Phones, Media Players, Digital Cameras, PDA's, Video Games, Hand Held Computers, etc.

#### MAXIMUM RATINGS (T<sub>J</sub> = 25°C unless otherwise stated)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>	20	V
Gate-to-Source Voltage	V <sub>GS</sub>	±10	V
Continuous Drain Current (Note 1)	I <sub>D</sub>	238	mA
Power Dissipation (Note 1)	P <sub>D</sub>	300	mW
Pulsed Drain Current	I <sub>DM</sub>	714	mA
Operating Junction and Storage Temperature	T <sub>J</sub> , T <sub>STG</sub>	-55 to 150	°C
Continuous Source Current (Body Diode)	I <sub>SD</sub>	238	mA
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	T <sub>L</sub>	260	°C

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

#### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction-to-Ambient – Steady State (Note 1)	R <sub>θJA</sub>	416	°C/W

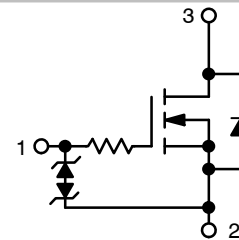
1. Surface-mounted on FR4 board using 1 in sq. pad size (Cu area = 1.127 in sq. [1 oz] including traces).



ON Semiconductor®

<http://onsemi.com>

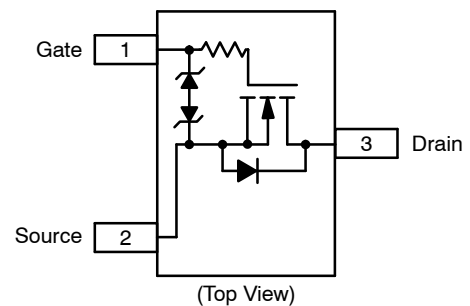
V <sub>(BR)DSS</sub>	R <sub>DS(on)</sub> Typ @ V <sub>GS</sub>	I <sub>D</sub> MAX (Note 1)
20 V	1.5 Ω @ 4.5 V	238 mA
	2.2 Ω @ 2.5 V	



N-Channel

#### PIN CONNECTIONS

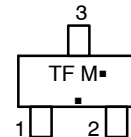
SC-75 (3-Leads)



(Top View)

#### MARKING DIAGRAM

SC-75 / SOT-416  
CASE 463  
STYLE 5



TF = Specific Device Code

M = Date Code

▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

**NTA4001N, NVA4001N****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	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 100\ \mu\text{A}$	20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}, V_{DS} = 20\text{ V}$			1.0	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{ V}$			$\pm 100$	$\mu\text{A}$

**ON CHARACTERISTICS** (Note 2)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = 3\text{ V}, I_D = 100\ \mu\text{A}$	0.5	1.0	1.5	V
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 10\text{ mA}$		1.5	3.0	$\Omega$
		$V_{GS} = 2.5\text{ V}, I_D = 10\text{ mA}$		2.2	3.5	
Forward Transconductance	$g_{FS}$	$V_{DS} = 3\text{ V}, I_D = 10\text{ mA}$		80		mS

**CAPACITANCES**

Input Capacitance	$C_{ISS}$	$V_{DS} = 5\text{ V}, f = 1\text{ MHz}, V_{GS} = 0\text{ V}$		11.5	20	pF
Output Capacitance	$C_{OSS}$			10	15	
Reverse Transfer Capacitance	$C_{RSS}$			3.5	6.0	

**SWITCHING CHARACTERISTICS** (Note 3)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 5\text{ V}, I_D = 10\text{ mA}, R_G = 10\ \Omega$		13		ns
Rise Time	$t_r$			15		
Turn-Off Delay Time	$t_{d(OFF)}$			98		
Fall Time	$t_f$			60		

**DRAIN-SOURCE DIODE CHARACTERISTICS**

Forward Diode Voltage	$V_{SD}$	$V_{GS} = 0\text{ V}, I_S = 10\text{ mA}$		0.66	0.8	V
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2. Pulse Test: pulse width  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$ .

3. Switching characteristics are independent of operating junction temperatures.

# NTA4001N, NVA4001N

## TYPICAL PERFORMANCE CURVES

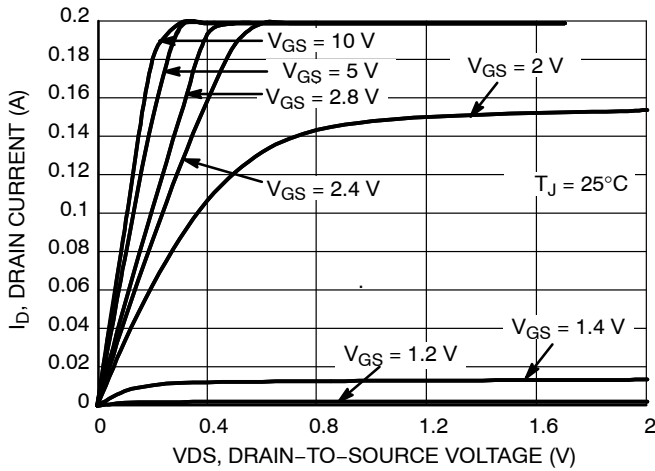


Figure 1. On-region Characteristics

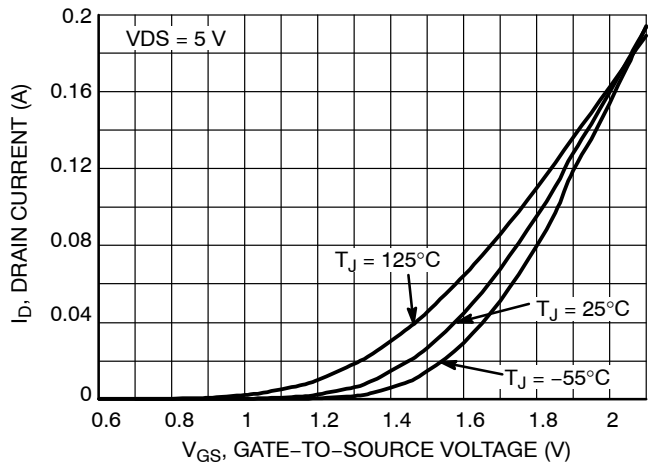


Figure 2. Transfer Characteristics

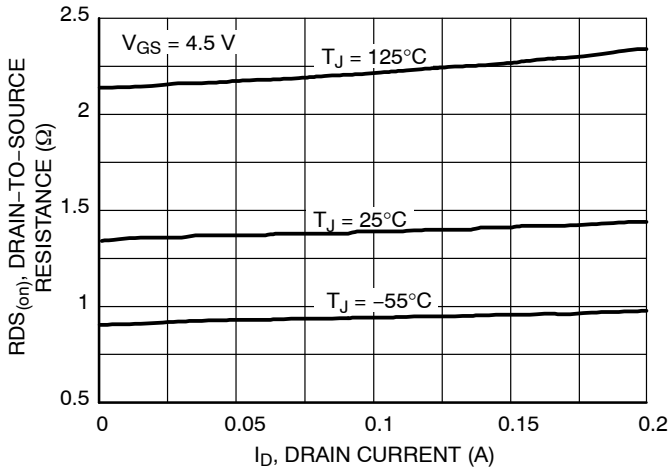


Figure 3. On-resistance versus Drain Current and Temperature

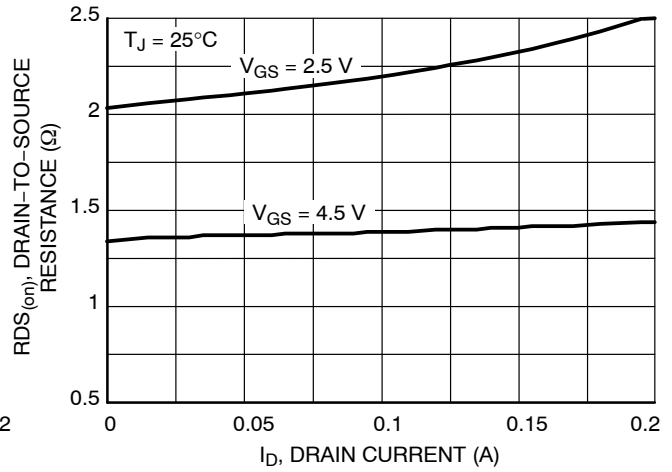


Figure 4. On-resistance versus Drain Current and Gate Voltage

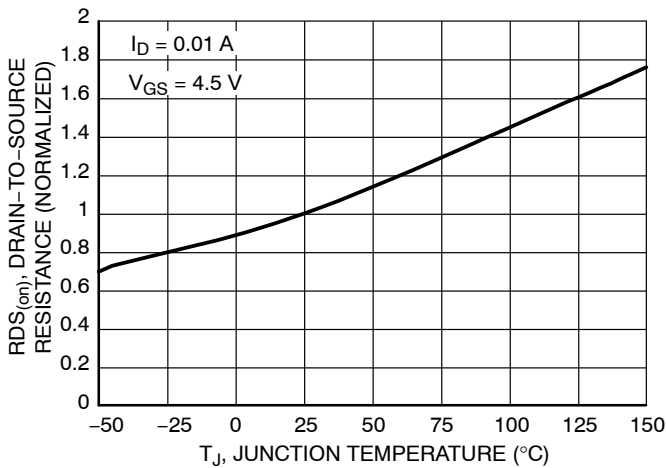


Figure 5. On-resistance Variation with Temperature

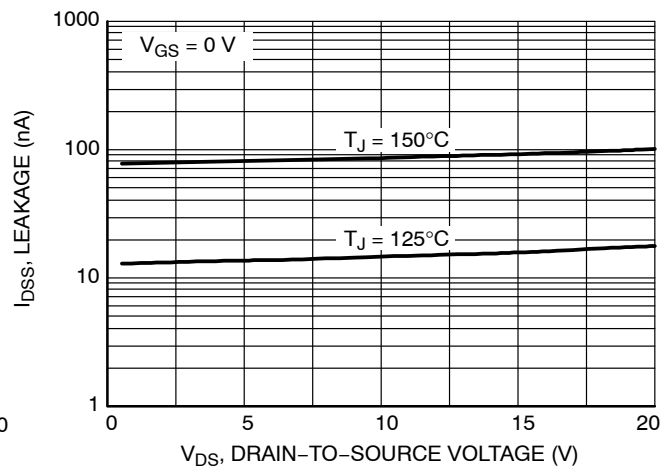


Figure 6. Drain-to-Source Leakage Current versus Voltage

# NTA4001N, NVA4001N

## TYPICAL PERFORMANCE CURVES

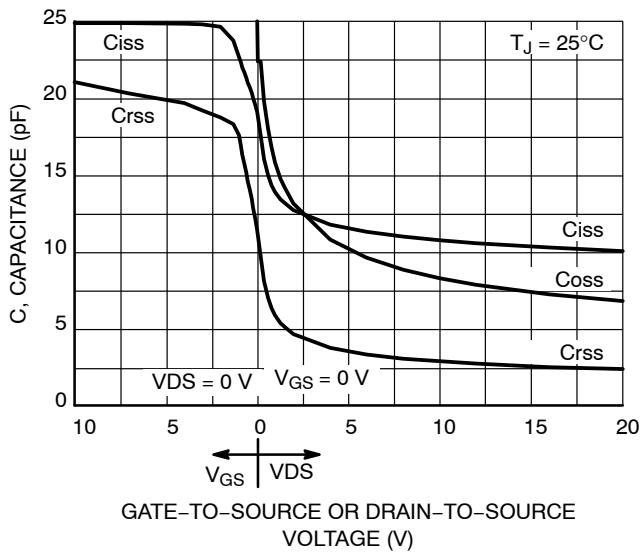


Figure 7. Capacitance Variation

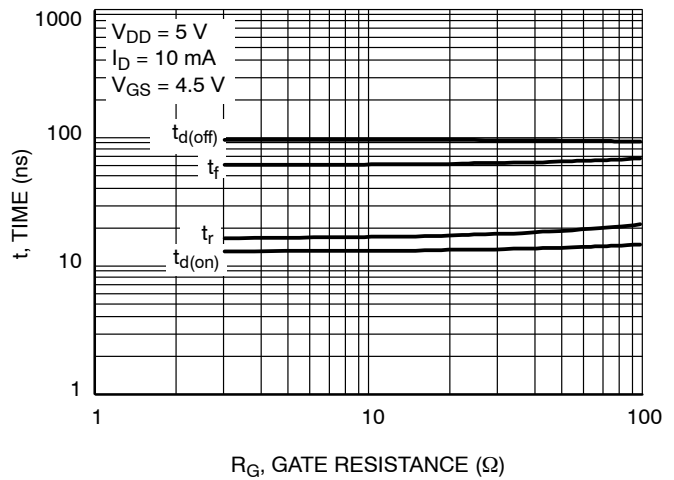


Figure 8. Resistive Switching Time Variation versus Gate Resistance

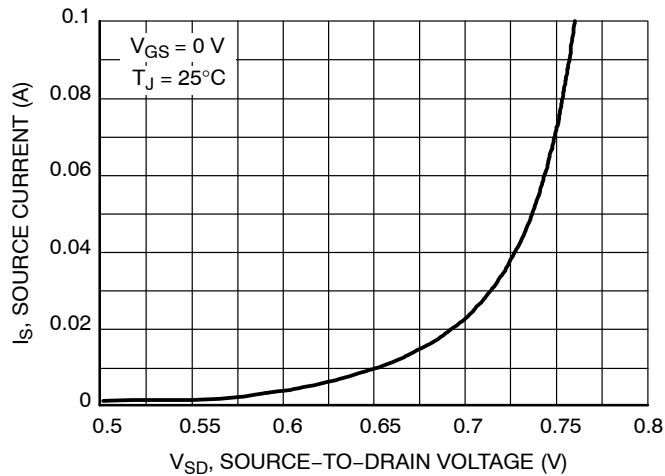


Figure 9. Diode Forward Voltage versus Current

### ORDERING INFORMATION

Order Number	Package	Shipping†
NTA4001NT1G	SC-75 (Pb-Free)	3000 / Tape & Reel
NVA4001NT1G	SC-75 (Pb-Free)	3000 / Tape & Reel

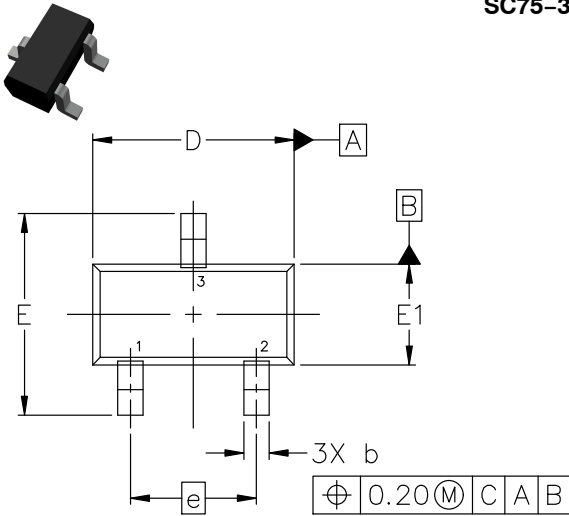
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.



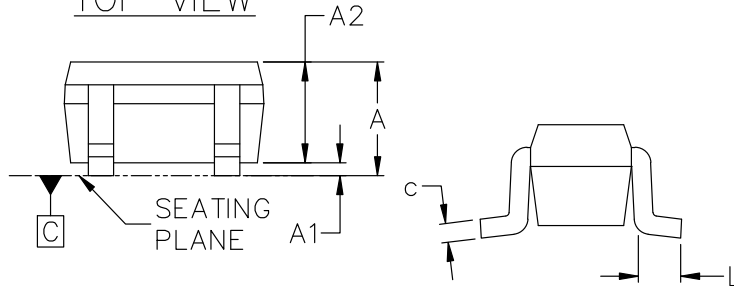
**MECHANICAL CASE OUTLINE  
PACKAGE DIMENSIONS**

**SC75-3 1.60x0.80x0.80, 1.00P**  
CASE 463  
ISSUE H

DATE 01 FEB 2024



TOP VIEW

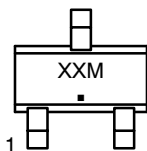


SIDE VIEW

END VIEW

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.70	0.80	0.90
A1	0.00	0.05	0.10
A2	0.80 REF.		
b	0.15	0.20	0.30
c	0.10	0.15	0.25
D	1.55	1.60	1.65
E	1.50	1.60	1.70
E1	0.70	0.80	0.90
e	1.00 BSC		
L	0.10	0.15	0.20

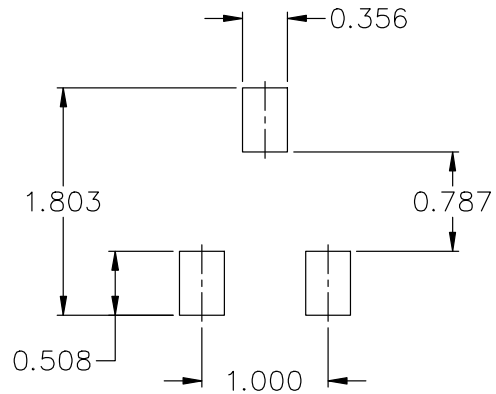
**GENERIC MARKING DIAGRAM\***



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

- STYLE 1:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR
- STYLE 2:  
PIN 1. ANODE  
2. N/C  
3. CATHODE
- STYLE 3:  
PIN 1. ANODE  
2. ANODE  
3. CATHODE
- STYLE 4:  
PIN 1. CATHODE  
2. CATHODE  
3. ANODE
- STYLE 5:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN



RECOMMENDED MOUNTING 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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<b>DESCRIPTION:</b>	<b>SC75-3 1.60x0.80x0.80, 1.00P</b>	<b>PAGE 1 OF 1</b>

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