

# NTES1N02

## Product Preview

### Power MOSFET 50 mAmps, 20 Volts N-Channel SC-75

- 2.5 V Gate Drive
- Low Threshold Voltage:  $V_{th} = 0.5$  to  $1.5$  V
- High Speed
- Enhancement Mode
- Small Package

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

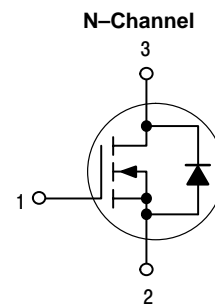
| Rating   | Symbol    | Value      | Unit             |
|--|-----------|------------|------------------|
| Drain-to-Source Voltage                                  | $V_{DS}$  | 20         | Vdc              |
| Gate-to-Source Voltage – Continuous                      | $V_{GSS}$ | 10         | Vdc              |
| Drain Current<br>– Continuous @ $T_A = 25^\circ\text{C}$ | $I_D$     | 50         | mA <sub>dc</sub> |
| Total Power Dissipation @ $T_A = 25^\circ\text{C}$       | $P_D$     | 100        | mW               |
| Channel Temperature                                      | $T_{ch}$  | 150        | $^\circ\text{C}$ |
| Operating and Storage Temperature Range                  | $T_{stg}$ | -55 to 150 | $^\circ\text{C}$ |



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**50 mAmps**  
**20 VOLTS**  
 **$R_{DS(on)} = 10 \Omega$**

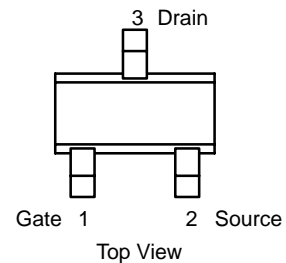


#### MARKING DIAGRAM



N02 = Device Code  
D = Date Code

#### PIN ASSIGNMENT



#### ORDERING INFORMATION

| Device   | Package | Shipping         |
|----------|---------|------------------|
| NTES1N02 | SC-75   | 3000 Tape & Reel |

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# NTES1N02

## ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Typ | Max | Unit |
|----------------|--------|-----|-----|-----|------|
|----------------|--------|-----|-----|-----|------|

### OFF CHARACTERISTICS

|   |                      |    |   |     |      |
|---|----------------------|----|---|-----|------|
| Drain-to-Source Breakdown Voltage<br>(V <sub>GS</sub> = 0 Vdc, I <sub>D</sub> = 100 μA) | V <sub>(BR)DSS</sub> | 20 | – | –   | Vdc  |
| Drain Cut-off Current<br>(V <sub>DS</sub> = 20 Vdc, V <sub>GS</sub> = 0 Vdc)            | I <sub>DSS</sub>     | –  | – | 1.0 | μAdc |
| Gate-Body Leakage Current (V <sub>GS</sub> = 10 Vdc, V <sub>DS</sub> = 0)               | I <sub>GSS</sub>     | –  | – | 1.0 | μAdc |

### ON CHARACTERISTICS

|  |                     |     |     |     |     |
|--|---------------------|-----|-----|-----|-----|
| Gate Threshold Voltage<br>(V <sub>DS</sub> = 3.0 Vdc, I <sub>D</sub> = 0.1 mAdc)       | V <sub>th</sub>     | 0.5 | –   | 1.5 | Vdc |
| Drain-to-Source On-Resistance<br>(V <sub>GS</sub> = 2.5 Vdc, I <sub>D</sub> = 10 mAdc) | R <sub>DS(on)</sub> | –   | 5.0 | 10  | Ω   |
| Forward Transfer Admittance (V <sub>DS</sub> = 3.0 Vdc, I <sub>D</sub> = 10 mAdc)      | Y <sub>FS</sub>     | 20  | –   | –   | mS  |

### DYNAMIC CHARACTERISTICS

|                              |  |                  |   |     |   |    |
|------------------------------|--|------------------|---|-----|---|----|
| Input Capacitance            | (V <sub>DS</sub> = 3.0 Vdc, V <sub>GS</sub> = 0 Vdc,<br>f = 1.0 MHz) | C <sub>iss</sub> | – | 5.5 | – | pF |
| Output Capacitance           | (V <sub>DS</sub> = 3.0 Vdc, V <sub>GS</sub> = 0 Vdc,<br>f = 1.0 MHz) | C <sub>oss</sub> | – | 25  | – |    |
| Reverse Transfer Capacitance | (V <sub>DS</sub> = 3.0 Vdc, V <sub>GS</sub> = 0 Vdc,<br>f = 1.0 MHz) | C <sub>rss</sub> | – | 1.6 | – |    |

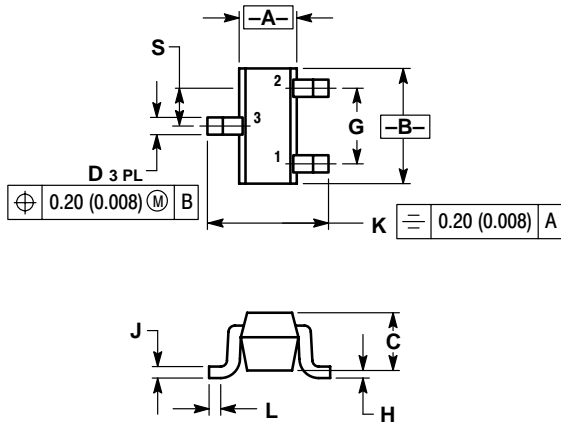
### SWITCHING CHARACTERISTICS

|                     |  |                  |   |      |   |    |
|---------------------|--|------------------|---|------|---|----|
| Turn-On Delay Time  | (V <sub>DD</sub> = 3.0 Vdc, I <sub>D</sub> = 10 mAdc,<br>V <sub>GS</sub> = 0 to 2.5 Vdc) | t <sub>on</sub>  | – | 0.14 | – | μs |
| Turn-Off Delay Time |  | t <sub>off</sub> | – | 0.14 | – |    |

# NTES1N02

## PACKAGE DIMENSIONS


SC-75 (SC-90, SOT-416)  
CASE 463-01  
ISSUE B



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

| DIM | MILLIMETERS |      | INCHES    |       |
|-----|-------------|------|-----------|-------|
|     | MIN         | MAX  | MIN       | MAX   |
| A   | 0.70        | 0.80 | 0.028     | 0.031 |
| B   | 1.40        | 1.80 | 0.055     | 0.071 |
| C   | 0.60        | 0.90 | 0.024     | 0.035 |
| D   | 0.15        | 0.30 | 0.006     | 0.012 |
| G   | 1.00 BSC    |      | 0.039 BSC |       |
| H   | ---         | 0.10 | ---       | 0.004 |
| J   | 0.10        | 0.25 | 0.004     | 0.010 |
| K   | 1.45        | 1.75 | 0.057     | 0.069 |
| L   | 0.10        | 0.20 | 0.004     | 0.008 |
| S   | 0.50 BSC    |      | 0.020 BSC |       |

- STYLE 1:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR

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