# VN0300L

Preferred Device

# Small Signal MOSFET 200 mAmps, 60 Volts

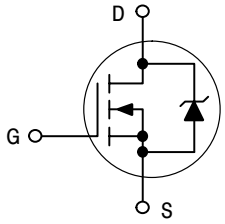
## N–Channel TO–92

ON Semiconductor

http://onsemi.com

**200 mAMPS**
**60 VOLTS**
**$R_{DS(on)}$ = 1.2 Ω**

**N–Channel**

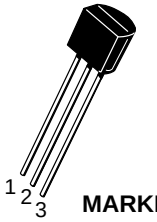



**MAXIMUM RATINGS**

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Drain–Source Voltage | $V_{DSS}$ | 60 | V |
| Drain–Gate Voltage | $V_{DGR}$ | 60 | V |
| Gate–Source Voltage<br>– Continuous<br>– Non–repetitive ($t_p \le 50$ μs) | <br>$V_{GS}$<br>$V_{GSM}$ | <br>± 20<br>± 40 | <br>Vdc<br>Vpk |
| Continuous Drain Current | $I_D$ | 200 | mA |
| Pulsed Drain Current | $I_{DM}$ | 500 | mA |
| Power Dissipation @ $T_C$ = 25°C<br>Derate above 25°C | $P_D$ | 350<br>2.8 | mW<br>mW/°C |
| Operating and Storage Temperature | $T_J$, $T_{stg}$ | – | °C |

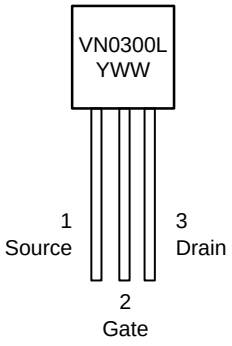
**THERMAL CHARACTERISTICS**

| Characteristics | Symbol | Max | Unit |
|---|---|---|---|
| Thermal Resistance, Junction to Ambient | $R_{\theta JA}$ | 312.5 | °C/W |
| Maximum Lead Temperature for Soldering Purposes, 1/16” from case for 10 seconds | $T_L$ | 300 | °C |




**TO–92**
**CASE 29**
**Style 22**

**MARKING DIAGRAM & PIN ASSIGNMENT**




Y = Year
WW = Work Week

**ORDERING INFORMATION**

| Device | Package | Shipping |
|---|---|---|
| VN0300L | TO–92 | 1000 Units/Box |
| VN0300LRLRA | TO–92 | 2000 Tape & Reel |
| VN0300LRLRE | TO–92 | 2000 Tape & Reel |

**Preferred** devices are recommended choices for future use and best overall value.

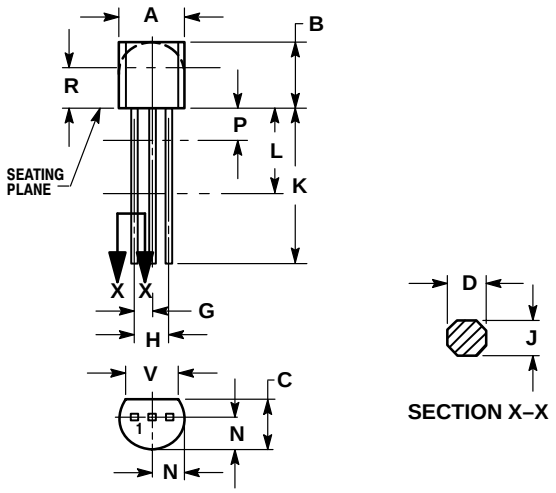
**ELECTRICAL CHARACTERISTICS** ($T_A$ = 25°C unless otherwise noted)

| Characteristic | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| **STATIC CHARACTERISTICS** | | | | |
| Drain–Source Breakdown Voltage ($V_{DS}$ = 0, $I_D$ = 10 μA) | $V_{(BR)DSS}$ | 30 | – | V |
| Zero Gate Voltage Drain Current ($V_{DS}$ = 48 Vdc, $V_{GS}$ = 0)<br>($V_{DS}$ = 48 Vdc, $V_{GS}$ = 0, $T_A$ = 125°C) | $I_{DSS}$ | –<br>– | 10<br>500 | μA |
| Gate–Body Leakage ($V_{DS}$ = 0, $V_{GS}$ = ±30 V) | $I_{GSS}$ | – | ±100 | nA |
| Gate Threshold Voltage ($V_{DS}$ = $V_{GS}$, $I_D$ = 1.0 mA) | $V_{GS(th)}$ | 0.8 | 2.5 | V |
| On–State Drain Current (Note 1.) ($V_{DS}$ = $V_{GS}$, $I_D$ = 1.0 mA) | $I_{D(on)}$ | 1.0 | – | A |
| Drain–Source On Resistance (Note 1.)<br>($V_{GS}$ = 5.0 V, $I_D$ = 0.3 A)<br>($V_{GS}$ = 10 V, $I_D$ = 1.0 A) | $r_{DS(on)}$ | –<br>– | 3.3<br>1.2 | Ω |
| Forward Transconductance (Note 1.) ($V_{DS}$ = 10 V, $I_D$ = 0.5 A) | $g_{fs}$ | 200 | – | mS |
| **DYNAMIC CHARACTERISTICS** | | | | |
| Input Capacitance | ($V_{DS}$ = 15 Vdc, $V_{GS}$ = 0, f = 1.0 MHz) | $C_{iss}$ | – | 100 | pF |
| Output Capacitance | | $C_{oss}$ | – | 95 | pF |
| Reverse Transfer Capacitance | | $C_{rss}$ | – | 25 | pF |
| **SWITCHING CHARACTERISTICS** | | | | |
| Turn–On Time | ($V_{DD}$ = 25 Vdc, $I_D$ = 1.0 A, $R_L$ = 24 Ω, RG = 25 Ω) | $t_{on}$ | – | 30 | ns |
| Turn–Off Time | | $t_{off}$ | – | 30 | ns |

1. Pulse Test; Pulse Width < 300 μs, Duty Cycle ≤ 2.0%.

## PACKAGE DIMENSIONS

**TO–92**
CASE 29–11
ISSUE AL




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.175 | 0.205 | 4.45 | 5.20 |
| B | 0.170 | 0.210 | 4.32 | 5.33 |
| C | 0.125 | 0.165 | 3.18 | 4.19 |
| D | 0.016 | 0.021 | 0.407 | 0.533 |
| G | 0.045 | 0.055 | 1.15 | 1.39 |
| H | 0.095 | 0.105 | 2.42 | 2.66 |
| J | 0.015 | 0.020 | 0.39 | 0.50 |
| K | 0.500 | --- | 12.70 | --- |
| L | 0.250 | --- | 6.35 | --- |
| N | 0.080 | 0.105 | 2.04 | 2.66 |
| P | --- | 0.100 | --- | 2.54 |
| R | 0.115 | --- | 2.93 | --- |
| V | 0.135 | --- | 3.43 | --- |

STYLE 22:
PIN 1. SOURCE
2. GATE
3. DRAIN

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