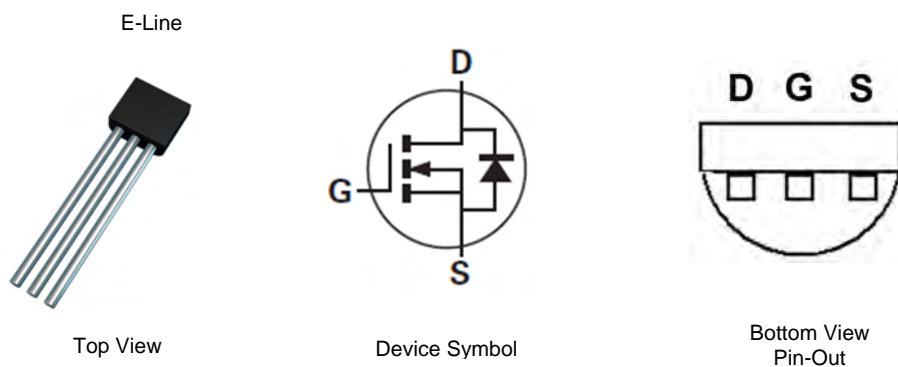


60V N-CHANNEL ENHANCEMENT MODE VERTICAL DMOS FET
Features

- $BV_{DSS} > 60V$
- $R_{DS(on)} \leq 5\Omega$ @ $V_{GS} = 10V$
- Maximum continuous drain current $I_D = 270mA$
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: E-Line (TO-92 Compatible)
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish (E3)
- Weight: 0.159 grams (approximate)


Ordering Information (Note 4)

| Product | Marking | Package | Quantity per box on tape |
|-----------|---------|---------|--------------------------|
| VN10LPSTZ | VN10LP | E-Line | 2,000 per ammo box |
| VN10LP | VN10LP | E-Line | 4,000 loose |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com>.

Marking Information

(Flat Face View)



VN10LP = Product type Marking Code

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|-------------------------------|------------------|-------|------|
| Drain-Source Voltage | V _{DSS} | 60 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current | I _D | 270 | mA |
| Pulsed Drain Current (Note 6) | I _{DM} | 3 | A |

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation (Note 5) | P _D | 625 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 200 | °C/W |
| Thermal Resistance, Junction to Leads (Note 7) | R _{θJL} | 71 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

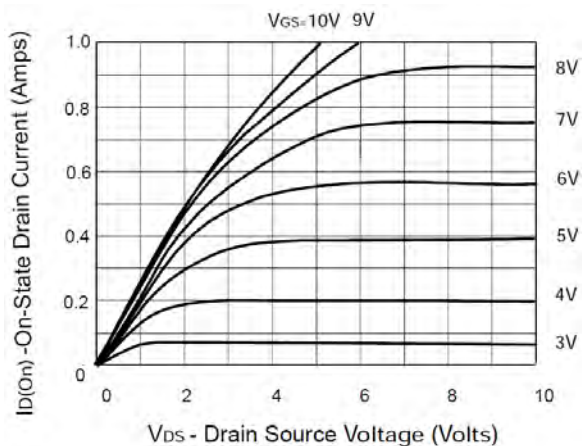
- Notes:
5. For a device mounted on 25mm X 25mm X 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air condition.
 6. Device mounted on minimum recommended pad layout test board, 10μs pulse duty cycle = 1%.
 7. Thermal resistance from junction to Drain leads 2mm outside plastic compound.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

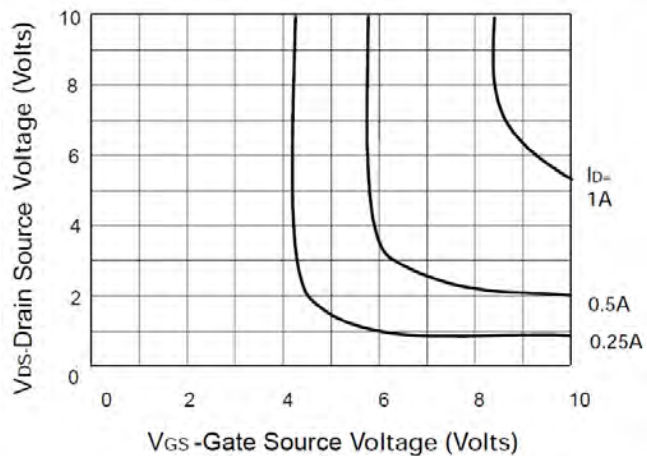
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|-----|-----|------|------|---|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 60 | — | — | V | I _D = 250μA, V _{GS} = 0V |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 10 | μA | V _{DS} = 60V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS | | | | | | |
| On state Drain Current (Note 8) | I _{D(on)} | 750 | — | — | mA | V _{DS} =15 V, V _{GS} =10V |
| Gate Threshold Voltage | V _{GS(th)} | 0.8 | — | 2.5 | V | I _D = 1mA, V _{DS} = V _{GS} |
| Static Drain-Source On-Resistance (Note 8) | R _{DS(on)} | — | — | 5.0 | Ω | V _{GS} = 10V, I _D = 500mA |
| | | | | 7.5 | | V _{GS} = 5V, I _D = 200mA |
| Forward Transconductance (Notes 8 and 10) | g _{fs} | 100 | — | — | mS | V _{DS} = 15V, I _D = 500mA |
| DYNAMIC CHARACTERISTICS (Note 10) | | | | | | |
| Input Capacitance | C _{iss} | — | — | 60 | pF | V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oss} | — | — | 25 | | |
| Reverse Transfer Capacitance | C _{rss} | — | — | 5 | | |
| Turn-On Time (Note 9) | t _(on) | — | — | 10 | ns | V _{DD} = 15V, I _D = 600mA |
| Turn-Off Time (Note 9) | t _(off) | — | — | 10 | | |

- Notes:
8. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.
 9. Switching characteristics are independent of operating junction temperature.
 10. For design aid only, not subject to production testing.

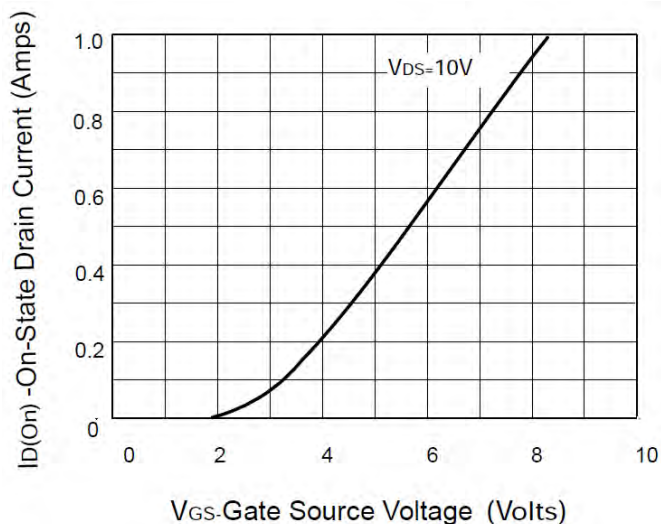
Typical Characteristics



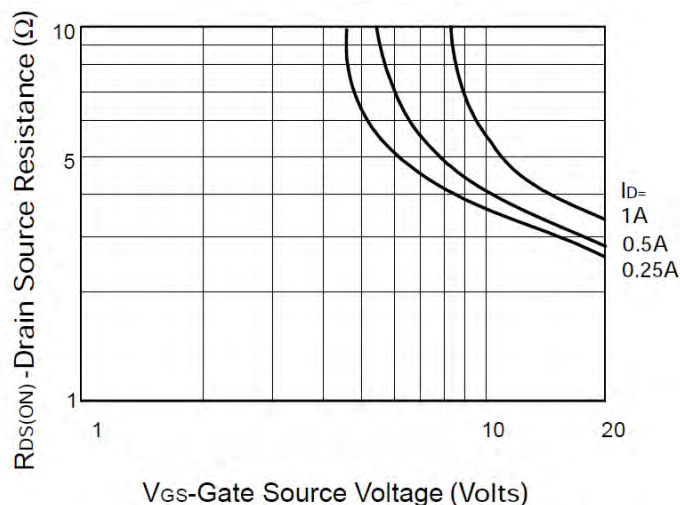
Saturation Characteristics



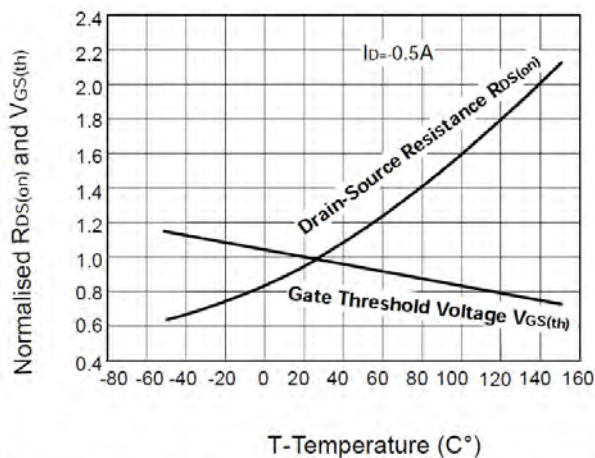
Voltage Saturation Characteristics



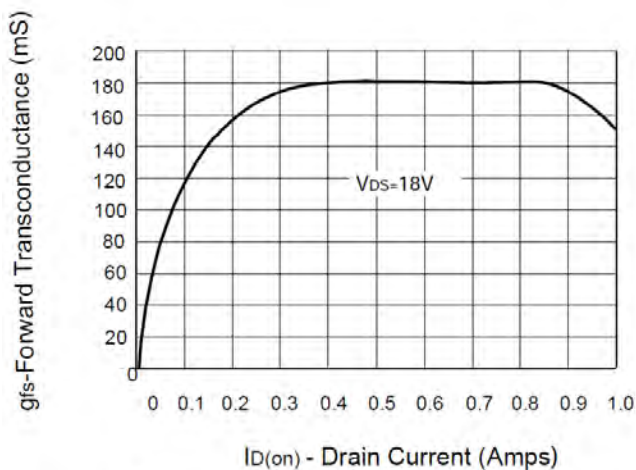
Transfer Characteristics



On-resistance vs gate-source voltage



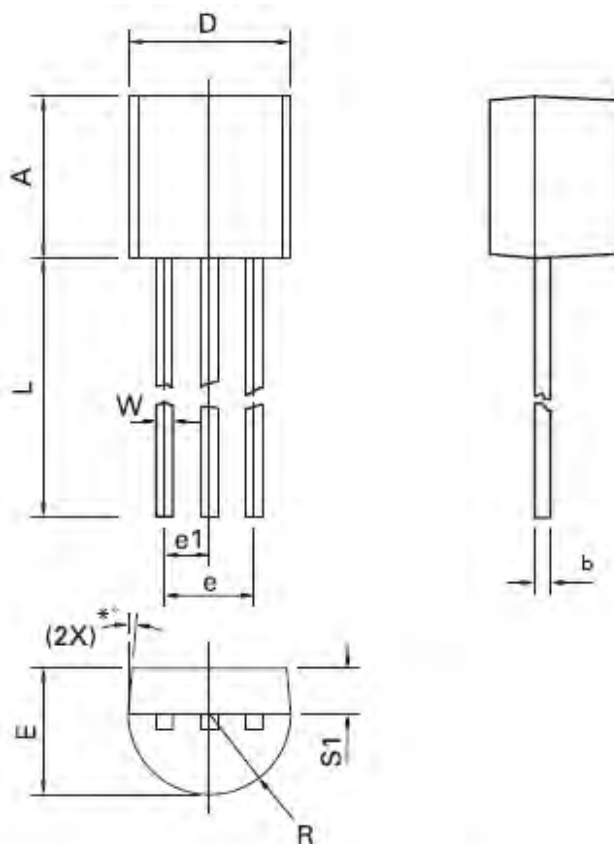
Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature



Transconductance v drain current

Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| Dim. | Millimeters | | Inches | |
|------|-------------|-------|--------|-------|
| | Min. | Max. | Min. | Max. |
| A | 4.32 | 4.95 | 0.170 | 0.195 |
| b | 0.36 | 0.51 | 0.014 | 0.020 |
| E | 3.30 | 3.94 | 0.130 | 0.155 |
| e | 2.41 | 2.67 | 0.095 | 0.105 |
| e1 | 1.14 | 1.40 | 0.045 | 0.055 |
| L | 12.70 | 15.49 | 0.500 | 0.610 |
| R | 2.16 | 2.41 | 0.085 | 0.095 |
| S1 | 1.14 | 1.52 | 0.045 | 0.060 |
| W | 0.41 | 0.56 | 0.016 | 0.022 |
| D | 4.45 | 4.95 | 0.175 | 0.195 |
| *° | 4° | 6° | 4° | 6° |

Note: Controlling dimensions are in millimeters. Approximate dimensions are provided in inches

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