

Product Summary

| $V_{(BR)DSS}$ | Max $R_{DS(ON)}$ | Max I_D $T_A = +25^\circ\text{C}$ (Note 6) |
|---------------|--|--|
| 20V | 120m Ω @ $V_{GS} = 4.5\text{V}$ | 3.1A |

Description and Applications

This new generation of trench MOSFETs from Zetex utilizes a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

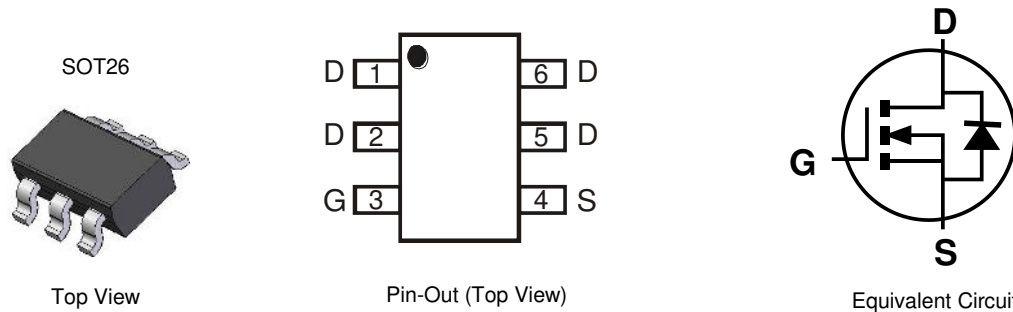
- DC - DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

Features and Benefits

- Low On-resistance
- Fast Switching Speed
- Low Threshold
- Low Gate Drive
- **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: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.016 grams (Approximate)

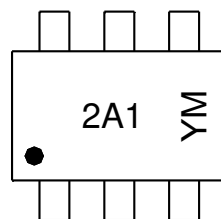


Ordering Information (Note 4)

| Part Number | Marking | Reel Size (inch) | Tape Width (mm) | Quantity Per Reel |
|--------------|---------|------------------|-----------------|-------------------|
| ZXMN2A01E6TA | 2A1 | 7 | 8 | 3000 |
| ZXMN2A01E6TC | 2A1 | 13 | 8 | 10,000 |

- 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/quality/lead_free.html 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/products/packages.html>.

Marking Information



2A1 = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: C = 2015)
 M or \bar{M} = Month (ex: 9 = September)

Date Code Key

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|------|------|------|------|
| Code | C | D | E | F | G | H | I | J |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Maximum Ratings (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit | |
|---|-----------------------|-----------|------------------------------------|------|---|
| Drain-Source Voltage | | V_{DSS} | 20 | V | |
| Gate-Source Voltage | | V_{GSS} | ± 12 | V | |
| Continuous Drain Current | $V_{GS} = 10\text{V}$ | I_D | $T_A = +25^\circ\text{C}$ (Note 6) | 3.1 | A |
| | | | $T_A = +70^\circ\text{C}$ (Note 6) | 2.5 | |
| | | | $T_A = +25^\circ\text{C}$ (Note 5) | 2.5 | |
| Pulsed Drain Current (Note 7) | | I_{DM} | 11 | A | |
| Continuous Source Current (Body Diode) (Note 6) | | I_S | 2.4 | A | |
| Pulsed Source Current (Body Diode) (Note 7) | | I_{SM} | 11 | A | |

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

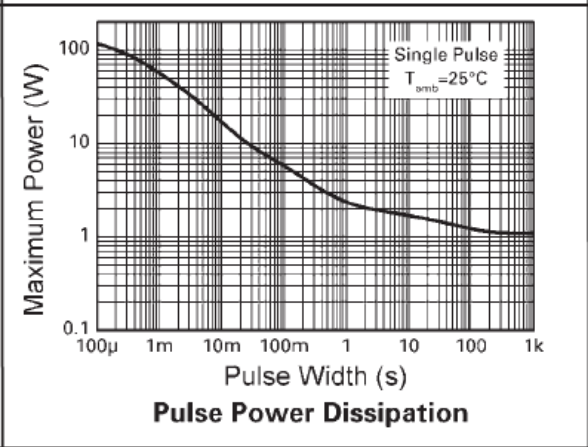
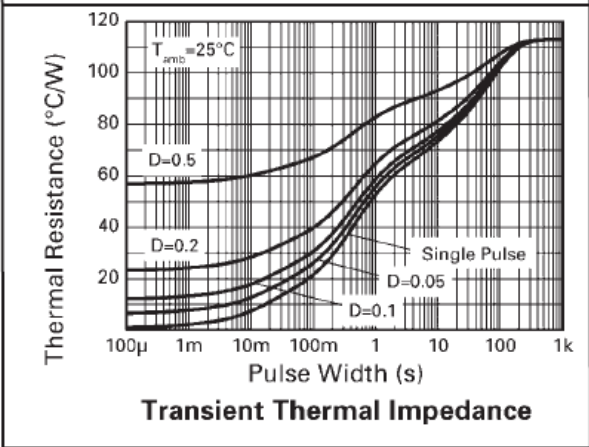
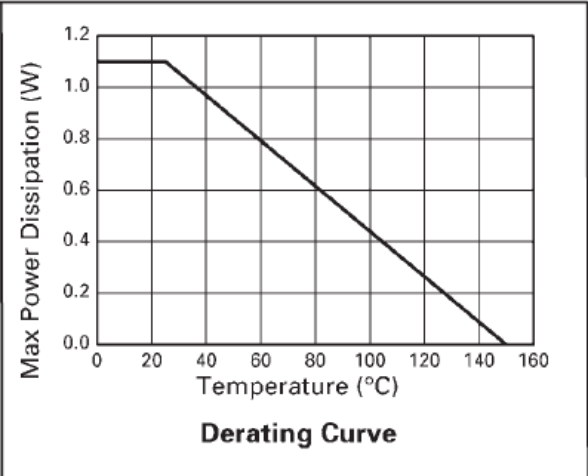
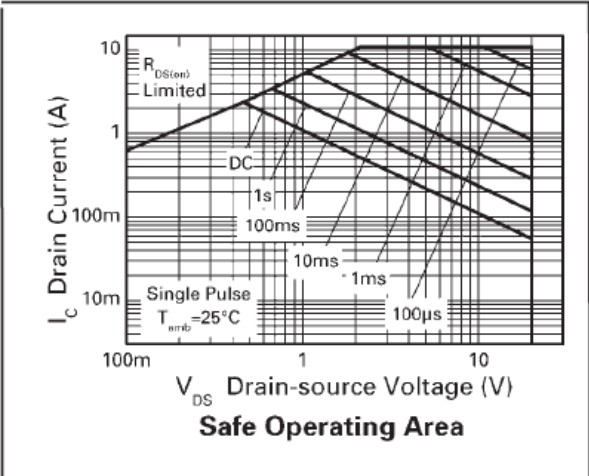
| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|---------------------------|
| Power Dissipation at $T_A = +25^\circ\text{C}$ (Note 5) | P_D | 1.1 | W |
| Linear derating factor | | 8.8 | mW/ $^\circ\text{C}$ |
| Power Dissipation at $T_A = +25^\circ\text{C}$ (Note 6) | P_D | 1.7 | W |
| Linear Derating Factor | | 13.6 | mW/ $^\circ\text{C}$ |
| Junction to Ambient (Note 5) | $R_{\theta JA}$ | 113 | $^\circ\text{C}/\text{W}$ |
| Junction to Ambient (Note 6) | $R_{\theta JA}$ | 70 | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

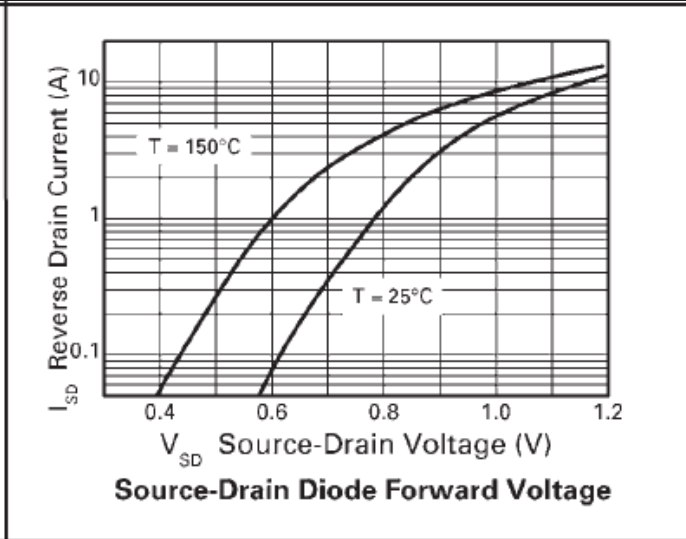
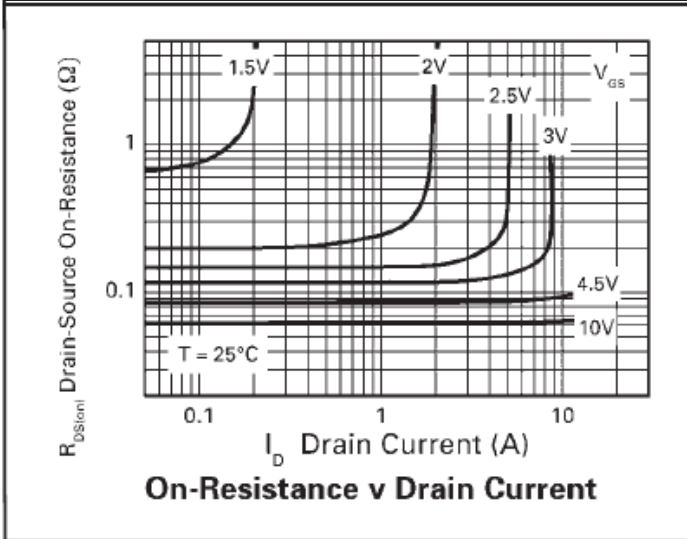
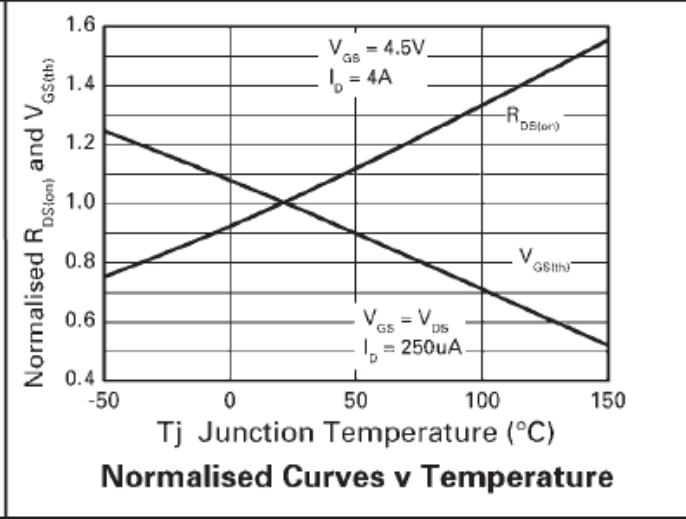
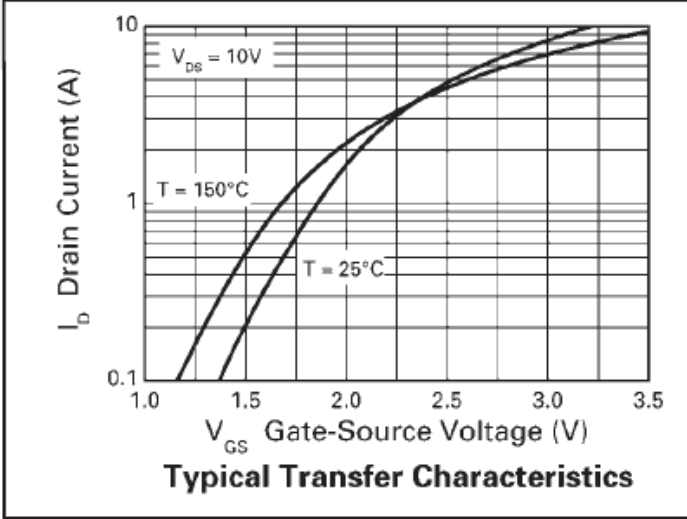
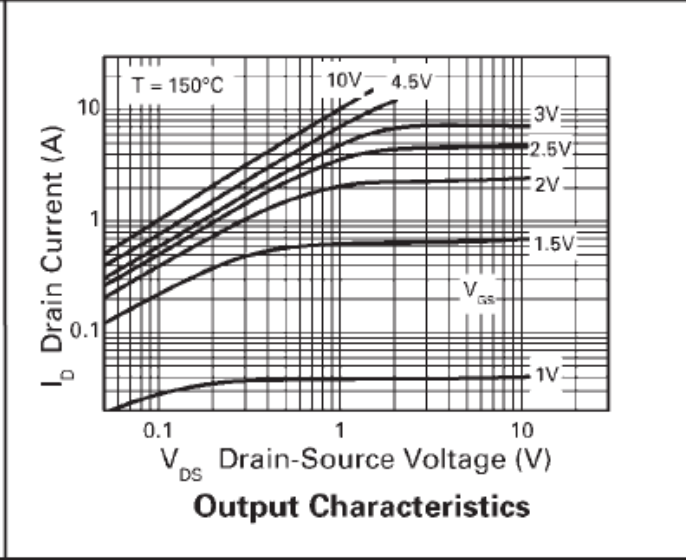
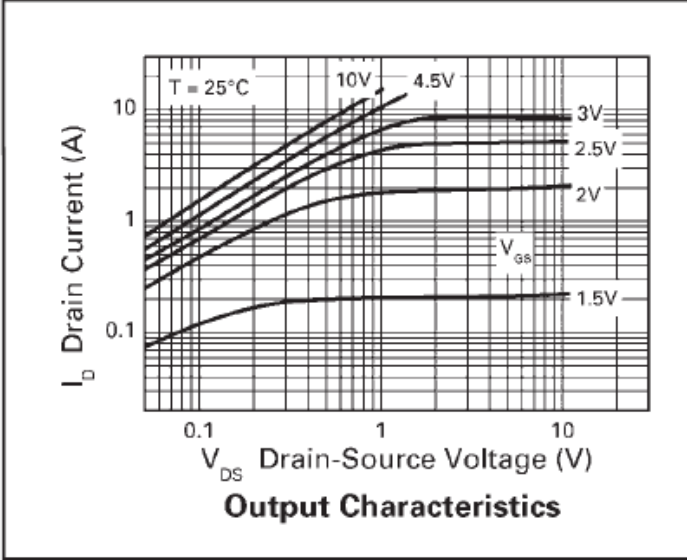
- Notes:
- For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 - For a device surface mounted on FR-4 PCB measured at $t \leq 10$ secs.
 - Repetitive rating 25mm x 25mm FR-4 PCB, $D = 0.05$, pulse width 10 μs - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

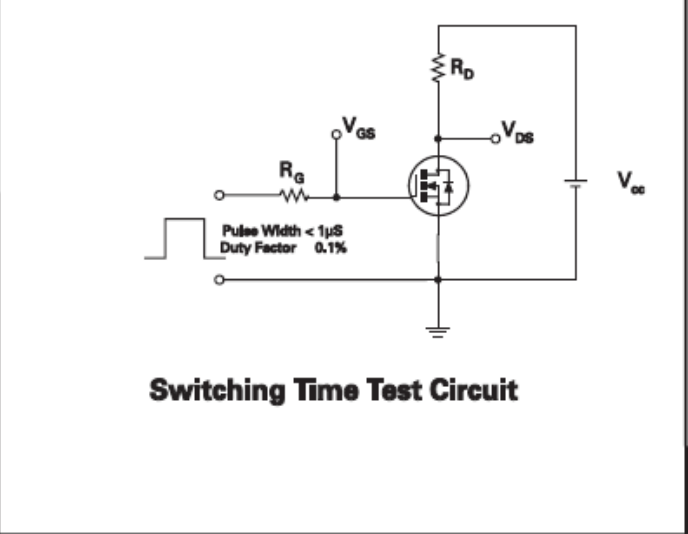
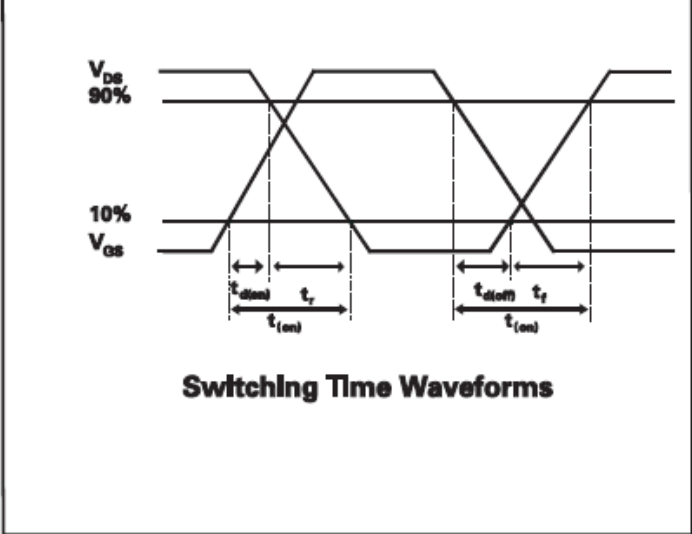
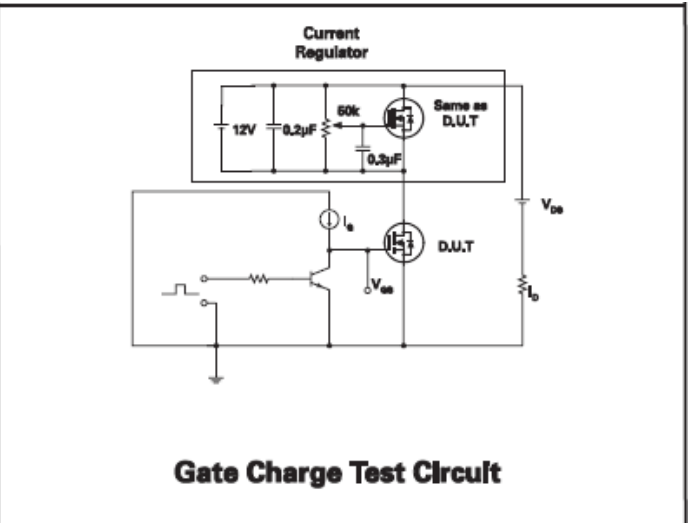
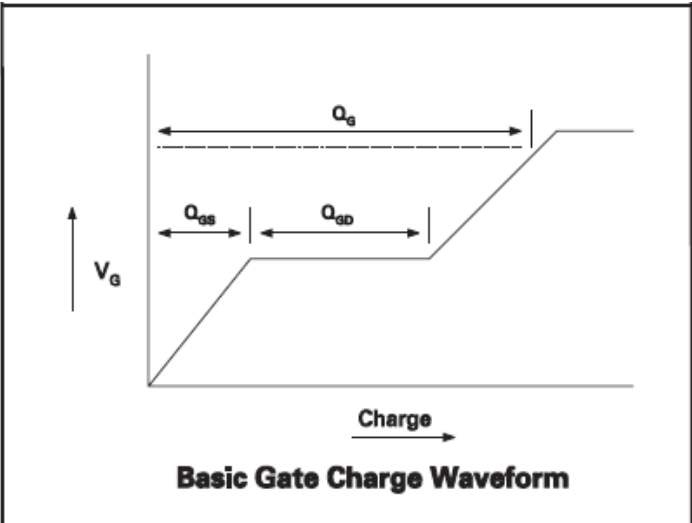
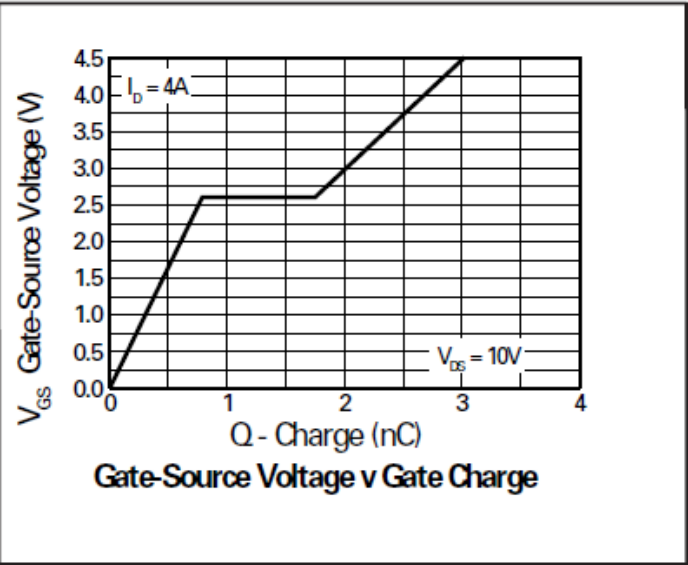
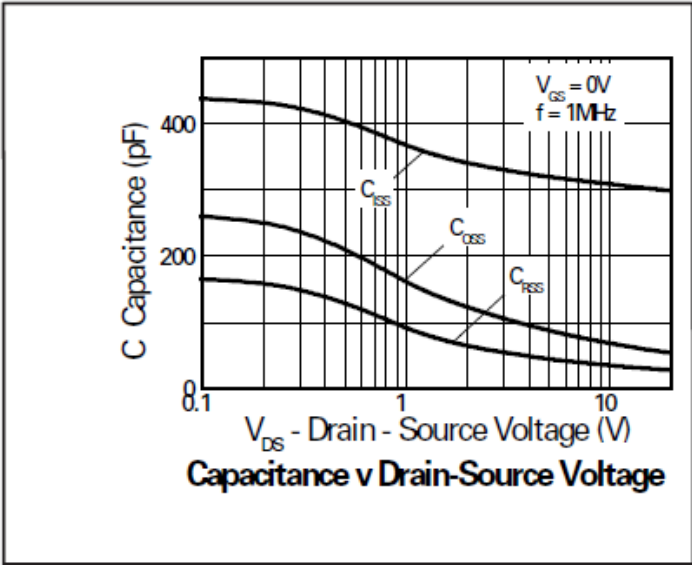
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------|-----|------|-------|---------------|--|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | 20 | - | - | V | $I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | - | - | 1 | μA | $V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Body Leakage | I_{GSS} | - | - | 100 | nA | $V_{GS} = \pm 12\text{V}, V_{DS} = 0\text{V}$ |
| Gate-Source Threshold Voltage | $V_{GS(TH)}$ | 0.7 | - | - | V | $I_D = 250\mu\text{A}, V_{DS} = V_{GS}$ |
| Static Drain-Source On-State Resistance (Note 8) | $R_{DS(ON)}$ | - | - | 0.120 | Ω | $V_{GS} = 4.5\text{V}, I_D = 4\text{A}$ |
| | | | | 0.225 | | $V_{GS} = 2.5\text{V}, I_D = 1.5\text{A}$ |
| Forward Transconductance (Notes 8 & 10) | g_{fs} | - | 6.1 | - | S | $V_{DS} = 10\text{V}, I_D = 4\text{A}$ |
| Diode Forward Voltage (Note 8) | V_{SD} | - | 0.9 | 0.95 | V | $T_J = +25^\circ\text{C}, I_S = 3.2\text{A}, V_{GS} = 0\text{V}$ |
| DYNAMIC CHARACTERISTICS | | | | | | |
| Input Capacitance (Note 10) | C_{iss} | - | 303 | - | pF | $V_{DS} = 15\text{V}, V_{GS} = 0\text{V}$ $f = 1\text{MHz}$ |
| Output Capacitance (Note 10) | C_{oss} | - | 59 | - | pF | |
| Reverse Transfer Capacitance (Note 10) | C_{rss} | - | 30 | - | pF | |
| Total Gate Charge (Notes 9 & 10) | Q_g | - | 3.0 | - | nC | $V_{GS} = 4.5\text{V}, V_{DS} = 10\text{V}$ $I_D = 4\text{A}$ |
| Gate-Source Charge (Notes 9 & 10) | Q_{gs} | - | 0.8 | - | nC | |
| Gate-Drain Charge (Notes 9 & 10) | Q_{gd} | - | 1.0 | - | nC | |
| Turn-On Delay Time (Notes 9 & 10) | $t_{D(ON)}$ | - | 2.49 | - | ns | $V_{DD} = 10\text{V}, V_{GS} = 5\text{V}$ $I_D = 4\text{A}, R_G = 6.0\Omega$ |
| Turn-On Rise Time (Notes 9 & 10) | t_R | - | 5.21 | - | ns | |
| Turn-Off Delay Time (Notes 9 & 10) | $t_{D(OFF)}$ | - | 7.47 | - | ns | |
| Turn-Off Fall Time (Notes 9 & 10) | t_F | - | 4.62 | - | ns | |
| Reverse Recovery Time (Note 10) | t_{RR} | - | 23 | - | ns | $T_J = +25^\circ\text{C}, I_F = 4\text{A},$ $di/dt = 100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge (Note 10) | Q_{RR} | - | 5.65 | - | nC | |

- Notes:
- Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.
 - Switching characteristics are independent of operating junction temperature.
 - For design aid only, not subject to production testing.

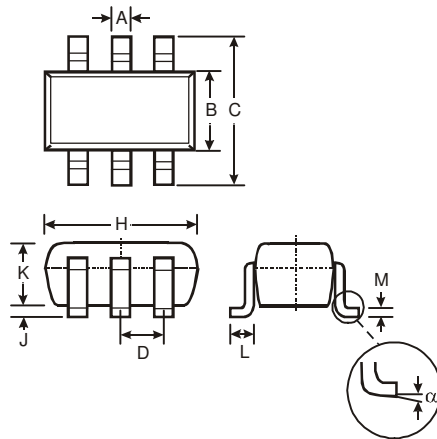






Package Outline Dimensions

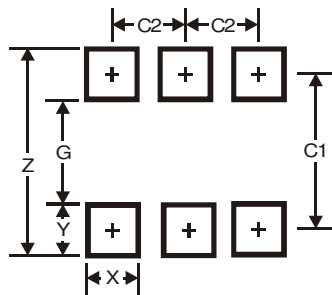
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT26 | | | |
|-----------------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 0.35 | 0.50 | 0.38 |
| B | 1.50 | 1.70 | 1.60 |
| C | 2.70 | 3.00 | 2.80 |
| D | — | — | 0.95 |
| H | 2.90 | 3.10 | 3.00 |
| J | 0.013 | 0.10 | 0.05 |
| K | 1.00 | 1.30 | 1.10 |
| L | 0.35 | 0.55 | 0.40 |
| M | 0.10 | 0.20 | 0.15 |
| α | 0° | 8° | — |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 3.20 |
| G | 1.60 |
| X | 0.55 |
| Y | 0.80 |
| C1 | 2.40 |
| C2 | 0.95 |

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