

Product Summary

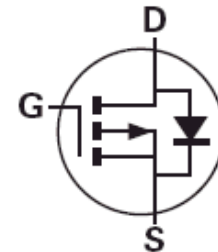
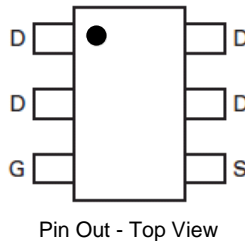
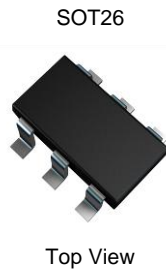
| BV _{DSS} | R _{DS(ON)} | I _D T _A = +25°C |
|-------------------|---------------------------------|--|
| -100V | 350mΩ @ V _{GS} = -10V | -1.6A |
| | 450mΩ @ V _{GS} = -6.0V | -1.4A |

Description

This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Motor Control
- DC-DC Converters
- Power Management Functions
- Uninterrupted Power Supply



Features and Benefits

- Fast Switching Speed
- Low Gate Drive
- Low Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXMP10A17E6Q is suitable for automotive applications requiring specific change control and is AEC-Q101 qualified, is PPAP capable, and is manufactured in IATF16949:2016 certified facilities.**

Mechanical Data

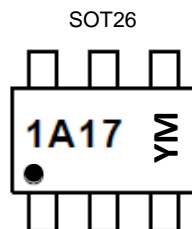
- Case: SOT26
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram Below
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.018 grams (Approximate)

Ordering Information (Note 4)

| Part Number | Qualification | Case | Packaging |
|-----------------|---------------|-------|-------------------|
| ZXMP10A17E6QTA | Automotive | SOT26 | 3,000/Tape & Reel |
| ZXMP10A17E6QTAR | Automotive | SOT26 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



1A17 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: G = 2019)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2015 | ... | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|------|------|-----|------|------|------|------|------|------|------|------|------|
| Code | C | ... | G | H | I | J | K | L | M | N | O |

| 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°C, unless otherwise specified.)

| Characteristic | | | Symbol | Value | Unit |
|--|-----------------------|---------------------------------|------------------|-------|------|
| Drain-Source Voltage | | | V _{DSS} | -100 | V |
| Gate-Source Voltage | | | V _{GSS} | ±20 | V |
| Continuous Drain Current | V _{GS} = 10V | (Note 6) | I _D | -1.6 | A |
| | | T _A = +70°C (Note 6) | | -1.3 | |
| | | (Note 5) | | -1.3 | |
| Pulsed Drain Current | V _{GS} = 10V | (Note 7) | I _{DM} | -7.7 | A |
| Continuous Source Current (Body Diode) | | | I _S | -2.1 | A |
| Pulsed Source Current (Body Diode) | | | I _{SM} | -7.7 | A |

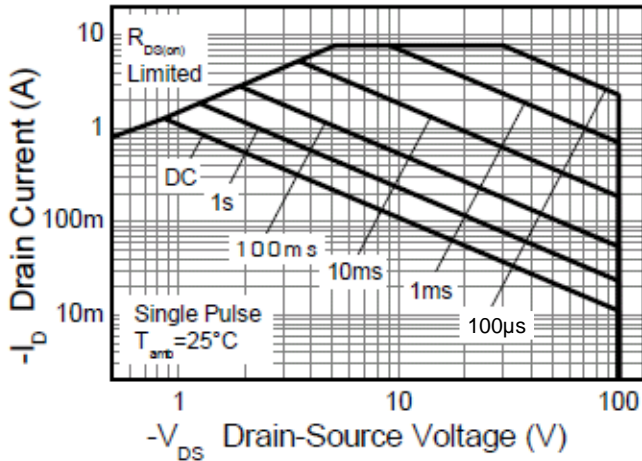
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | | Symbol | Value | Unit |
|---|----------|-----------------------------------|-------------|------------|
| Power Dissipation Linear Derating Factor | (Note 5) | P _D | 1.1 | W mW/°C |
| | (Note 6) | | 8.8 | |
| | (Note 6) | | 1.7 13.7 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | R _{θJA} | 113 | °C/W |
| | (Note 6) | | 73 | |
| Operating and Storage Temperature Range | | T _J , T _{STG} | -55 to +150 | °C |

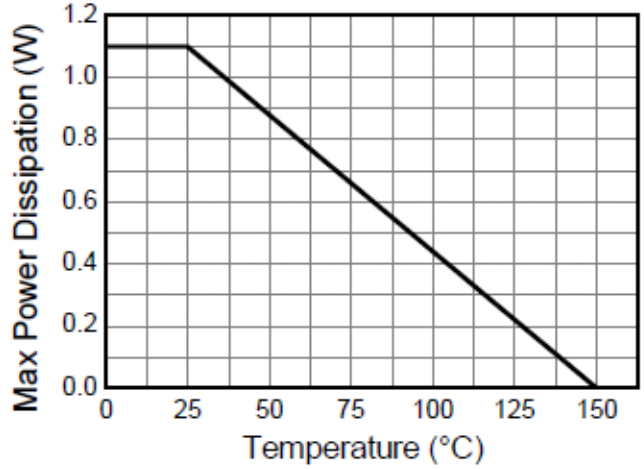
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|------|-------|-------|------|---|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -100 | — | — | V | I _D = -250μA, V _{GS} = 0V |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -0.5 | μA | V _{DS} = -100V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -2.0 | — | -4.0 | V | I _D = -250μA, V _{DS} = V _{GS} |
| Static Drain-Source On-Resistance (Note 8) | R _{DS(ON)} | — | — | 0.350 | Ω | V _{GS} = -10V, I _D = -1.4A |
| | | | | 0.450 | | V _{GS} = -6V, I _D = -1.2A |
| Forward Transconductance (Notes 8 & 9) | g _{fs} | — | 2.8 | — | S | V _{DS} = -15V, I _D = -1.4A |
| Diode Forward Voltage (Note 8) | V _{SD} | — | -0.85 | -0.95 | V | I _S = -1.7A, V _{GS} = 0V |
| Reverse Recovery Time (Note 9) | t _{RR} | — | 33 | — | ns | I _S = -1.5A, di/dt = 100A/μs |
| Reverse Recovery Charge (Note 9) | Q _{RR} | — | 48 | — | nC | |
| DYNAMIC CHARACTERISTICS (Note 9) | | | | | | |
| Input Capacitance | C _{iss} | — | 424 | — | pF | V _{DS} = -50V, V _{GS} = 0V f = 1MHz |
| Output Capacitance | C _{oss} | — | 36.6 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 29.8 | — | pF | |
| Total Gate Charge (Note 10) | Q _g | — | 7.1 | — | nC | V _{GS} = -6V |
| Total Gate Charge (Note 10) | Q _g | — | 10.7 | — | nC | V _{GS} = -10V V _{DS} = -50V I _D = -1.4A |
| Gate-Source Charge (Note 10) | Q _{gs} | — | 1.7 | — | nC | |
| Gate-Drain Charge (Note 10) | Q _{gd} | — | 3.8 | — | nC | |
| Turn-On Delay Time (Note 10) | t _{D(ON)} | — | 3 | — | ns | V _{DD} = -50V, V _{GS} = -10V I _D = -1A, R _G = 6.0Ω |
| Turn-On Rise Time (Note 10) | t _R | — | 3.5 | — | ns | |
| Turn-Off Delay Time (Note 10) | t _{D(OFF)} | — | 13.4 | — | ns | |
| Turn-Off Fall Time (Note 10) | t _F | — | 7.2 | — | ns | |

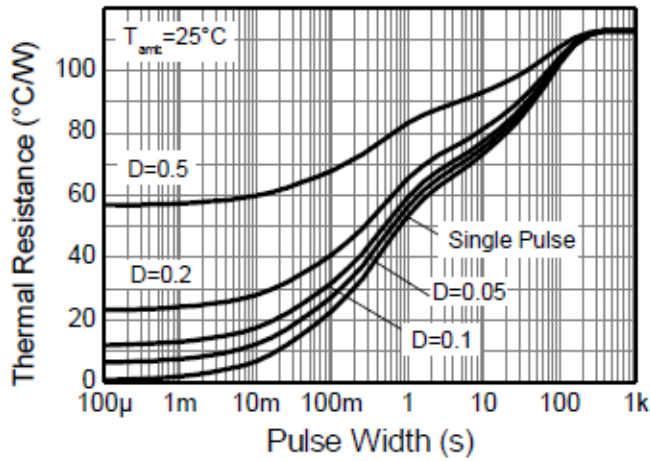
- Notes:
- For a device surface mounted on 25mm x 25mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 - Same as Note 5, except the device is measured at t ≤ 5 sec.
 - Same as Note 5, except the device is pulsed with D = 0.05 and pulse width 10μs. The pulse current is limited by the maximum junction temperature.
 - Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%.
 - For design aid only, not subject to production testing.
 - Switching characteristics are independent of operating junction temperatures.



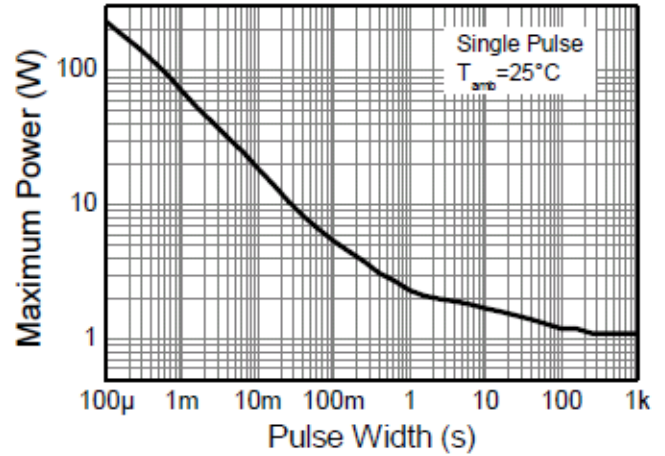
Safe Operating Area



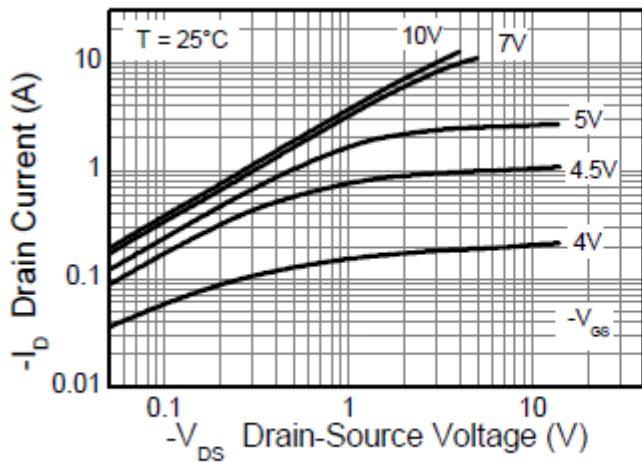
Derating Curve



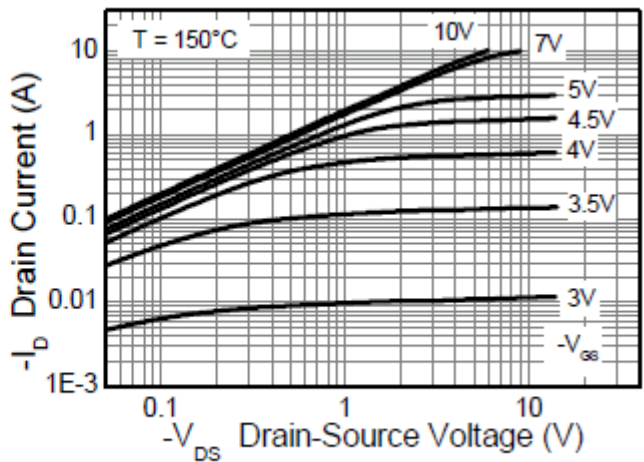
Transient Thermal Impedance



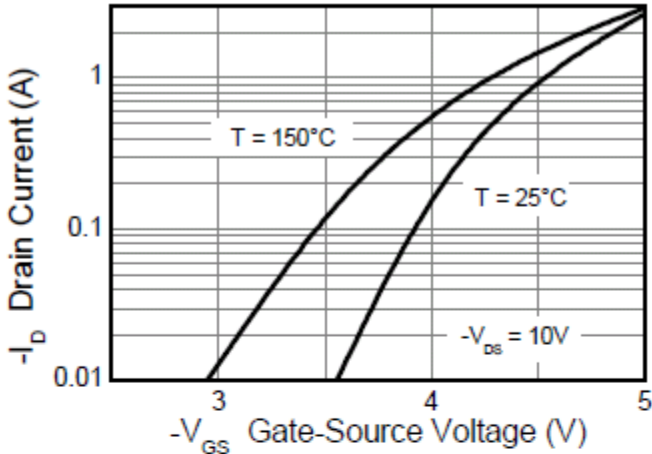
Pulse Power Dissipation



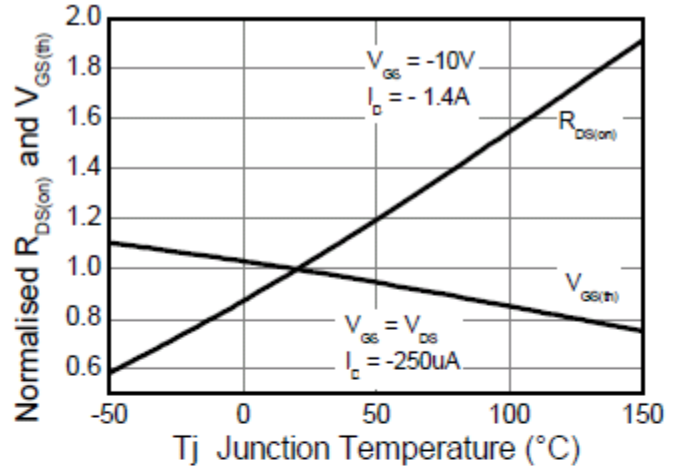
Output Characteristics



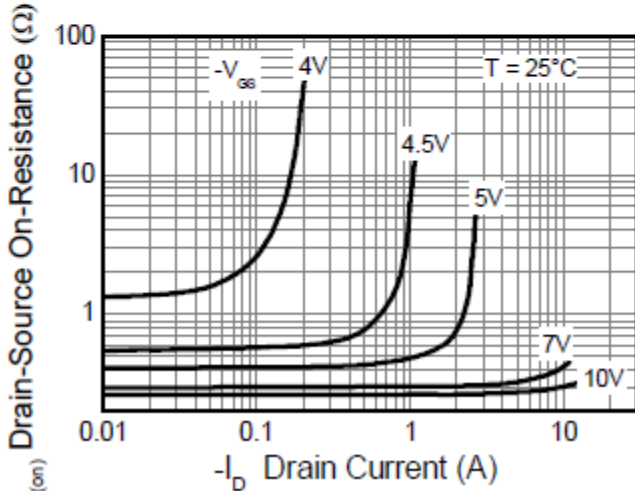
Output Characteristics



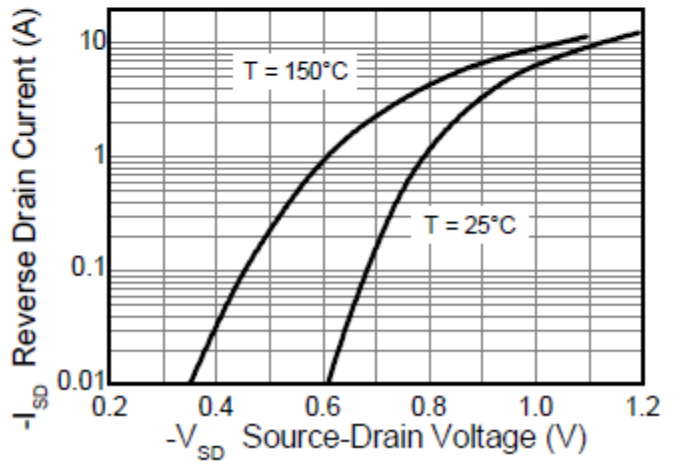
Typical Transfer Characteristics



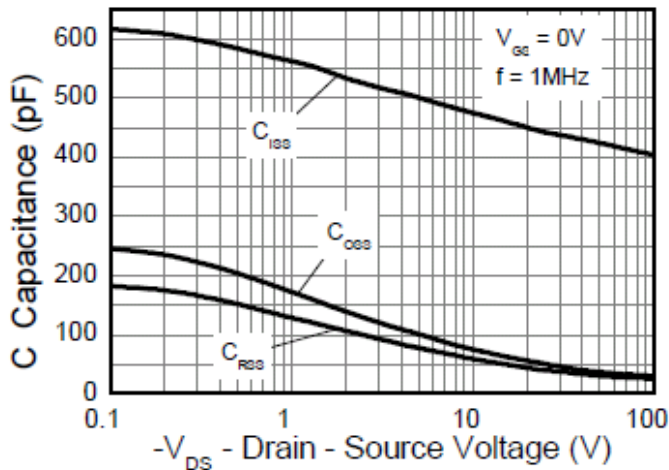
Normalised Curves v Temperature



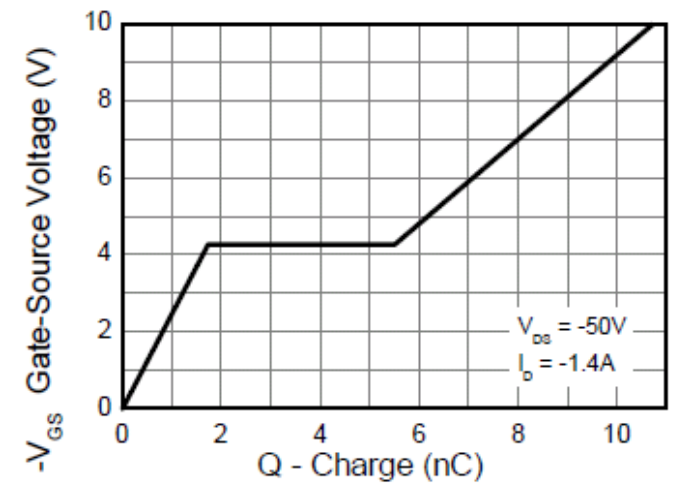
On-Resistance v Drain Current



Source-Drain Diode Forward Voltage

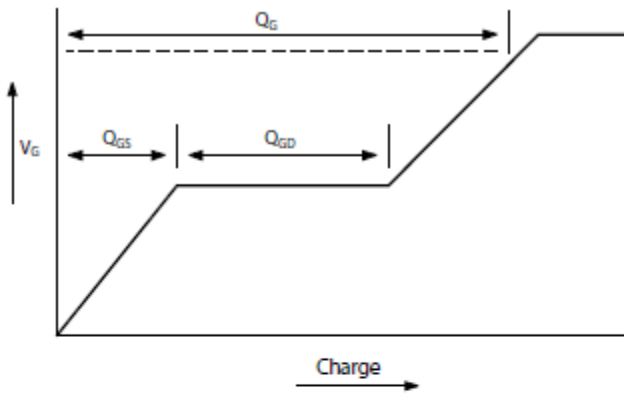


Capacitance v Drain-Source Voltage

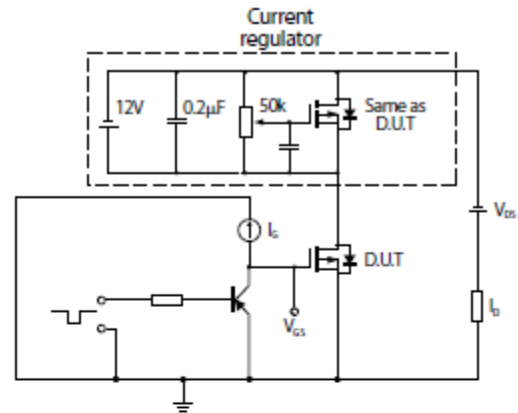


Gate-Source Voltage v Gate Charge

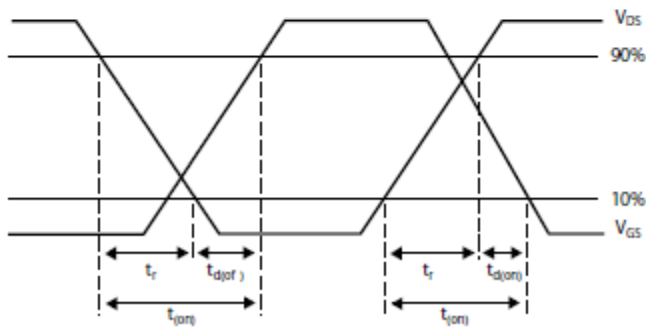
Test Circuits



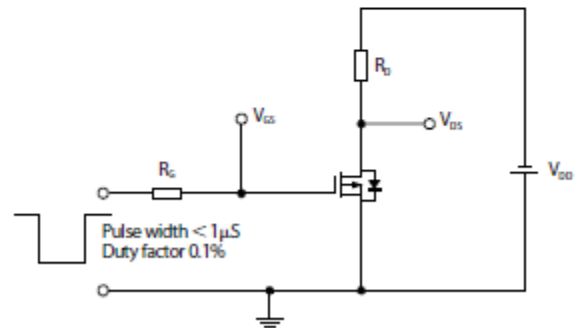
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

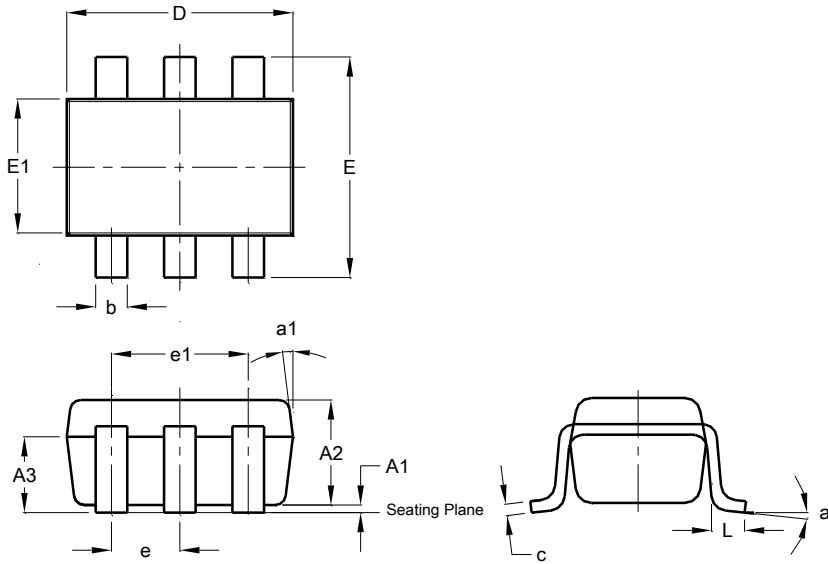


Switching time test circuit

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT26

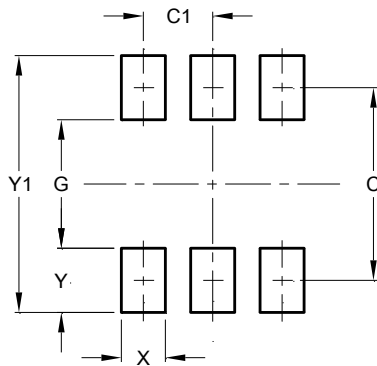


| SOT26 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A1 | 0.013 | 0.10 | 0.05 |
| A2 | 1.00 | 1.30 | 1.10 |
| A3 | 0.70 | 0.80 | 0.75 |
| b | 0.35 | 0.50 | 0.38 |
| c | 0.10 | 0.20 | 0.15 |
| D | 2.90 | 3.10 | 3.00 |
| e | - | - | 0.95 |
| e1 | - | - | 1.90 |
| E | 2.70 | 3.00 | 2.80 |
| E1 | 1.50 | 1.70 | 1.60 |
| L | 0.35 | 0.55 | 0.40 |
| a | - | - | 8° |
| a1 | - | - | 7° |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT26

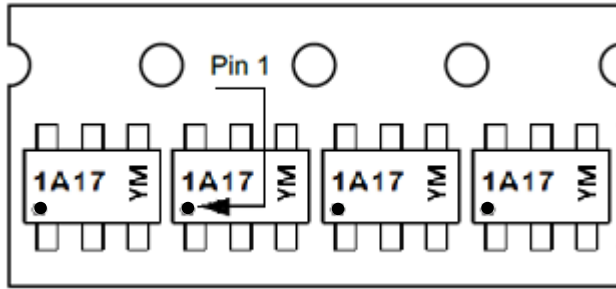


| Dimensions | Value (in mm) |
|------------|---------------|
| C | 2.40 |
| C1 | 0.95 |
| G | 1.60 |
| X | 0.55 |
| Y | 0.80 |
| Y1 | 3.20 |

Tape and Reel Information

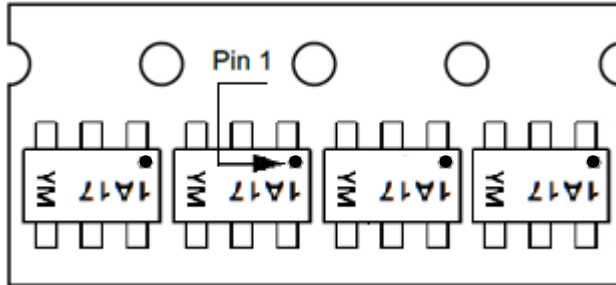
Please see <https://www.diodes.com/assets/Packaging-Support-Docs/Ap02007.pdf> for the latest version.

ZXMP10A17E6QTA



ZXMP10A17E6QTAR

Rotate 180 degree of Pin 1 orientation in the carrier tape.



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