

100V P-CHANNEL ENHANCEMENT MODE MOSFET
Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on) \max}$ | I_D $T_A = +25^\circ\text{C}$ |
|---------------|---|------------------------------------|
| -100V | 350m Ω @ $V_{GS} = -10\text{V}$ | -2.4A |
| | 450m Ω @ $V_{GS} = -4.5\text{V}$ | -2.1A |

Features and Benefits

- Fast Switching Speed
- Low Input Capacitance
- 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**
- **PPAP Capable (Note 4)**

Description and Applications

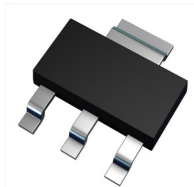
This MOSFET is designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor Control
- DC-DC Converters
- Power Management Functions
- Relay and Solenoid Driving

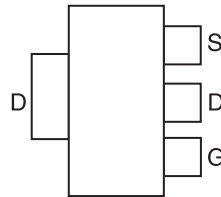
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic; 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 208③
- Weight: 0.112 grams (Approximate)

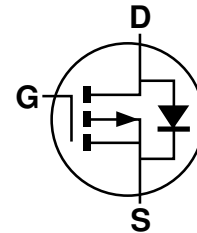
SOT223



Top View



Pin Out - Top

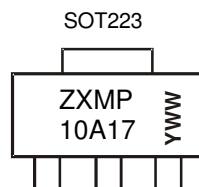


Equivalent Circuit

Ordering Information (Note 5)

| Product | Case | Packaging |
|---------------|--------|-------------------|
| ZXMP10A17GQTA | SOT223 | 1,000/Tape & Reel |
| ZXMP10A17GQTC | SOT223 | 4,000/Tape & Reel |

- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information


ZXMP10A17 = Product Type Marking Code
 YWW = Date Code Marking
 Y = Year (ex: 4 = 2014)
 WW = Week (01 - 53)

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

| Characteristic | | Symbol | Value | Unit | |
|--|-----------------------|------------------|---------------------------------|------|---|
| Drain-Source Voltage | | V _{DSS} | -100 | V | |
| Gate-Source Voltage | | V _{GS} | ±20 | V | |
| Continuous Drain Current | V _{GS} = 10V | I _D | (Note 7) | -2.4 | A |
| | | | T _A = +70°C (Note 7) | -1.9 | |
| | | | (Note 6) | -1.7 | |
| Pulsed Drain Current | V _{GS} = 10V | I _{DM} | -9.4 | A | |
| Continuous Source Current (Body Diode) | | I _S | -4.5 | A | |
| Pulsed Source Current (Body Diode) | | I _{SM} | -9.4 | A | |

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

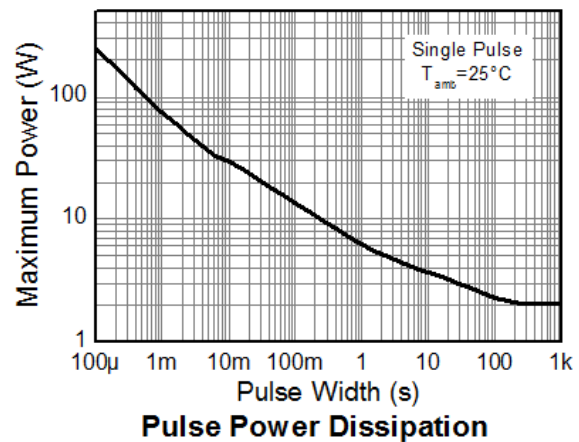
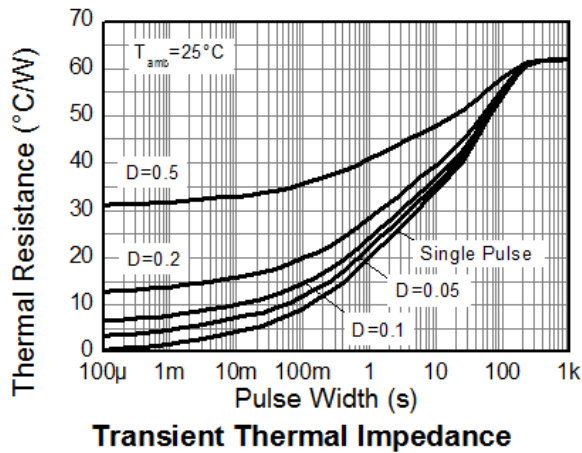
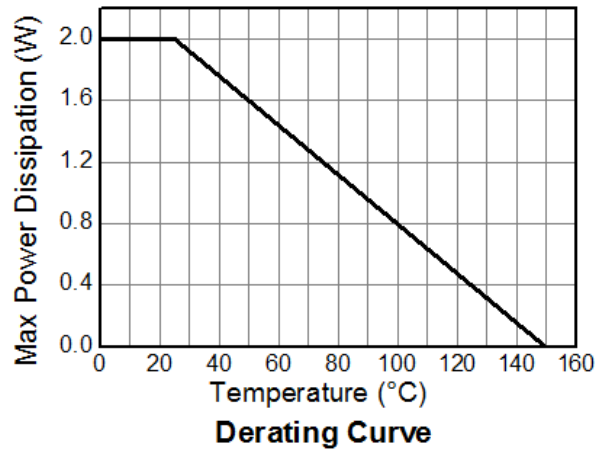
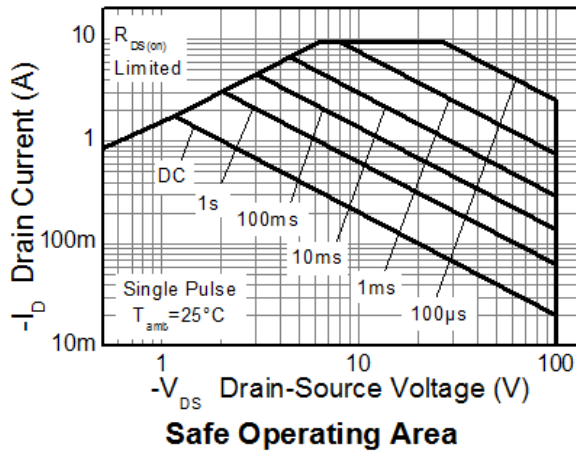
| Characteristic | | Symbol | Value | Unit |
|---|------------------------|-----------------------------------|------------|-------|
| Power dissipation | (Note 6) | P _D | 2.0 | W |
| | Linear derating factor | | 16 | |
| | (Note 7) | | 3.9 | mW/°C |
| | | | 31 | |
| Thermal Resistance, Junction to Ambient | (Note 6) | R _{θJA} | 62.5 | °C/W |
| | (Note 7) | | 32.0 | |
| Thermal Resistance, Junction to Case | (Note 6) | R _{θJC} | 7.7 | |
| Operating and storage temperature range | | T _J , T _{STG} | -55 to 150 | °C |

Electrical Characteristics @T_A = 25°C unless otherwise specified

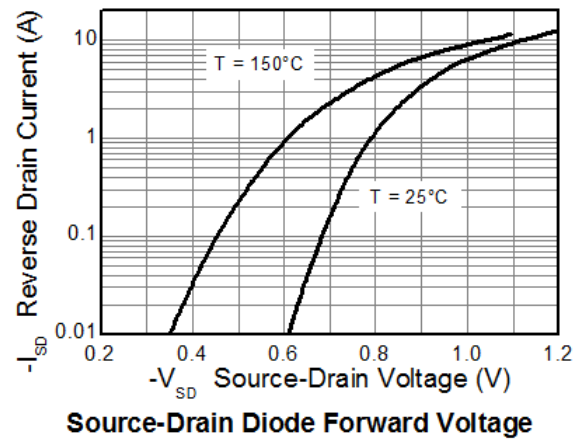
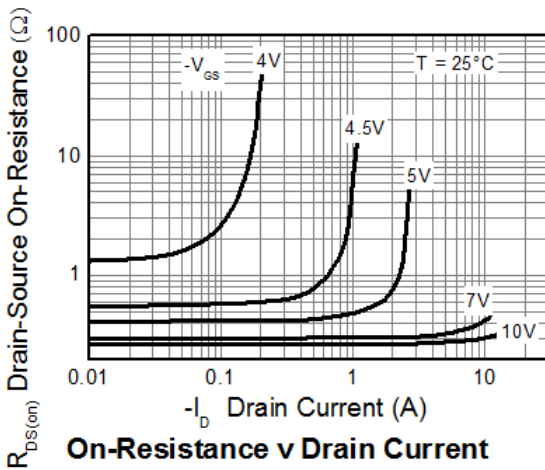
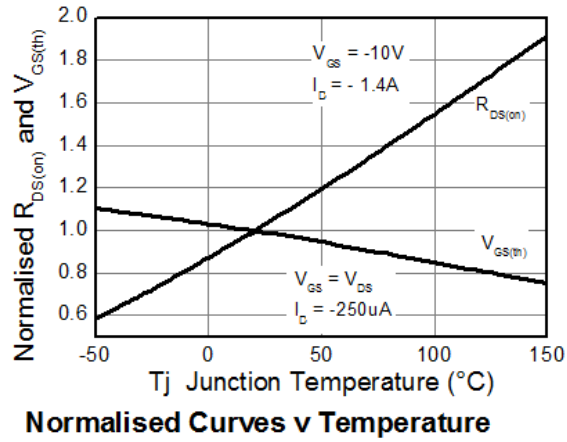
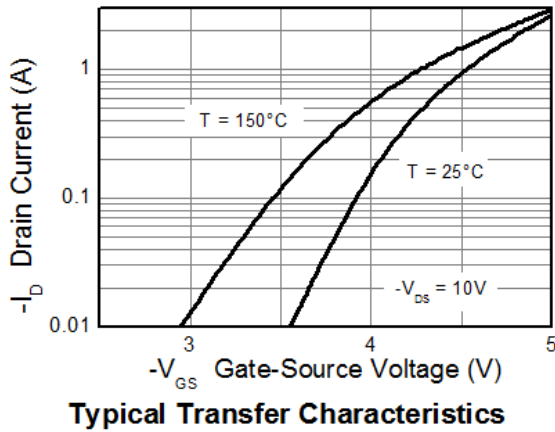
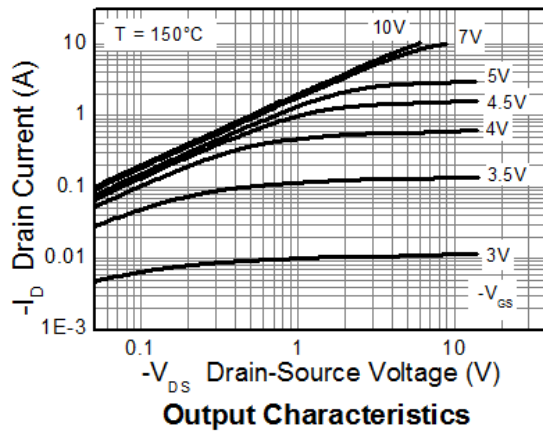
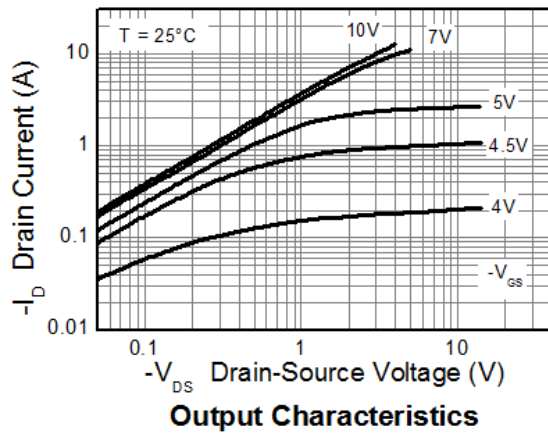
| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|---------------------|------|-------|-------|------|---|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -100 | — | — | V | I _D = -250μA, V _{GS} = 0V |
| Zero Gate Voltage Drain Current | I _{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 9) | 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 9 & 10) | g _{fs} | — | 2.8 | — | S | V _{DS} = -15V, I _D = -1.4A |
| Diode Forward Voltage (Note 9) | V _{SD} | — | -0.85 | -0.95 | V | I _S = -1.7A, V _{GS} = 0V |
| Reverse recovery Time (Note 10) | t _{rr} | — | 33 | — | ns | I _F = -1.5A, di/dt = 100A/μs |
| Reverse recovery Charge (Note 10) | Q _{rr} | — | 48 | — | nC | |
| DYNAMIC CHARACTERISTICS (Note 10) | | | | | | |
| 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 11) | Q _g | — | 7.1 | — | nC | V _{GS} = -6.0V |
| Total Gate Charge (Note 11) | Q _g | — | 10.7 | — | nC | V _{GS} = -10V V _{DS} = -50V I _D = -1.4A |
| Gate-Source Charge (Note 11) | Q _{gs} | — | 1.7 | — | nC | |
| Gate-Drain Charge (Note 11) | Q _{gd} | — | 3.8 | — | nC | |
| Turn-On Delay Time (Note 11) | t _{D(on)} | — | 3.0 | — | ns | V _{DD} = -15V, V _{GS} = -10V I _D = -1A, R _G ≅ 6.0Ω |
| Turn-On Rise Time (Note 11) | t _r | — | 3.5 | — | ns | |
| Turn-Off Delay Time (Note 11) | t _{D(off)} | — | 13.4 | — | ns | |
| Turn-Off Fall Time (Note 11) | t _f | — | 7.2 | — | ns | |

- Notes:
- For a device surface mounted on 25mm x 25mm x 1.6mm FR4 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 6, except the device is measured at t ≤ 10 seconds.
 - Same as Note 6, except the device is pulsed with D = 0.02 and pulse width 300 μs. 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.

Thermal Characteristics

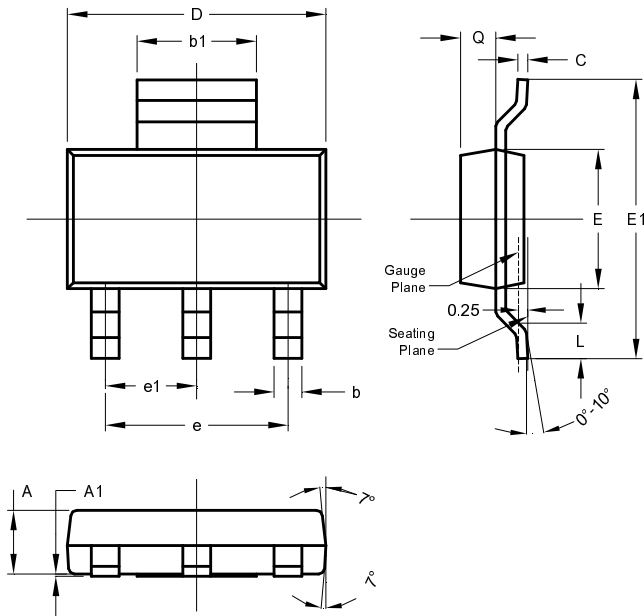


Typical Characteristics



Package Outline Dimensions

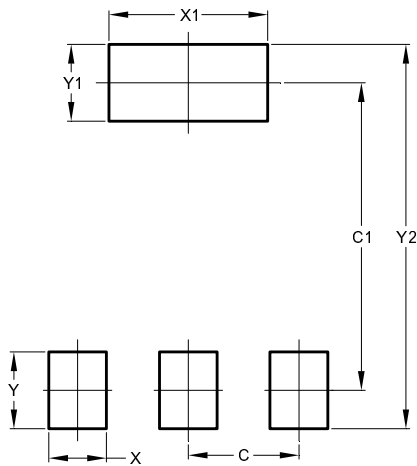
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT223 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b | 0.60 | 0.80 | 0.70 |
| b1 | 2.90 | 3.10 | 3.00 |
| C | 0.20 | 0.30 | 0.25 |
| D | 6.45 | 6.55 | 6.50 |
| E | 3.45 | 3.55 | 3.50 |
| E1 | 6.90 | 7.10 | 7.00 |
| e | - | - | 4.60 |
| e1 | - | - | 2.30 |
| L | 0.85 | 1.05 | 0.95 |
| Q | 0.84 | 0.94 | 0.89 |
| 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) |
|------------|---------------|
| C | 2.30 |
| C1 | 6.40 |
| X | 1.20 |
| X1 | 3.30 |
| Y | 1.60 |
| Y1 | 1.60 |
| Y2 | 8.00 |

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Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А