

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(on)}$ Max | I_D Max @ $T_A = 25^\circ C$ |
|---------------|------------------------|--------------------------------|
| -30V | 2.4Ω @ $V_{GS} = -10V$ | -250mA |
| | 4Ω @ $V_{GS} = -4.5V$ | -200mA |

Description

This MOSFET has been designed to minimize the on-state resistance ($R_{DS(on)}$) and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

Applications

- Load Switch
- Portable Applications
- Power Management Functions

Features

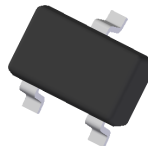
- Low On-Resistance
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

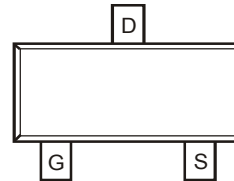
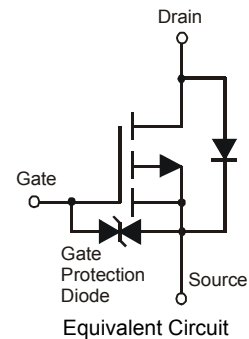
- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Weight: 0.006 grams (approximate)



SOT323



Top View

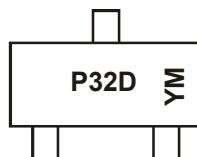

 Top View
Pin-out


Ordering Information (Note 4)

| Product | Marking | Reel size (inches) | Quantity per reel |
|--------------|---------|--------------------|-------------------|
| DMP32D4SW-7 | P32D | 7 | 3,000 |
| DMP32D4SW-13 | P32D | 13 | 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



P32D = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: Z = 2012)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------|------|------|------|------|------|------|------|
| Code | Z | A | B | C | D | E | F |

| 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} | -30 | V |
| Gate-Source Voltage | | | V_{GSS} | ± 20 | V |
| Continuous Drain Current (Note 6) | $V_{GS} = -10\text{V}$ | $T_A = +25^\circ\text{C}$ | I_D | 250 | mA |
| | | $T_A = +70^\circ\text{C}$ | | 200 | |
| Pulsed Drain Current (Note 6) | | | I_{DM} | -1 | A |

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

| Characteristic | | Symbol | Value | Units |
|---|----------|-----------------|------------|--------------------|
| Total Power Dissipation | (Note 5) | P_D | 300 | mW |
| | (Note 6) | | 432 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | 398 | $^\circ\text{C/W}$ |
| | (Note 6) | | 290 | |
| Thermal Resistance, Junction to Case | (Note 5) | $R_{\theta JC}$ | 142 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | | T_J, T_{STG} | -55 to 150 | $^\circ\text{C}$ |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|--------------|------|-------|----------|---------------|---|
| OFF CHARACTERISTICS (Note 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV_{DSS} | -30 | - | - | V | $V_{GS} = 0\text{V}, I_D = -1\text{mA}$ |
| Zero Gate Voltage Drain Current $T_J = +25^\circ\text{C}$ | I_{DSS} | - | - | -1 | μA | $V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$ |
| Gate-Source Leakage | I_{GSS} | - | - | ± 10 | μA | $V_{GS} = \pm 16\text{V}, V_{DS} = 0\text{V}$ |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | -1.4 | - | -2.4 | V | $V_{DS} = V_{GS}, I_D = -250\mu\text{A}$ |
| Static Drain-Source On-Resistance | $R_{DS(on)}$ | - | - | 2.4 | Ω | $V_{GS} = -10\text{V}, I_D = -0.5\text{A}$ |
| | | | | 4 | | $V_{GS} = -4.5\text{V}, I_D = -0.3\text{A}$ |
| Forward Transfer Admittance | $ Y_{fs} $ | - | 6 | - | S | $V_{DS} = -10\text{V}, I_D = -400\text{mA}$ |
| Diode Forward Voltage | V_{SD} | - | 0.8 | 1.2 | V | $V_{GS} = 0\text{V}, I_S = -300\text{mA}$ |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C_{iss} | - | 51.16 | - | pF | $V_{DS} = -15\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$ |
| Output Capacitance | C_{oss} | - | 10.85 | - | pF | |
| Reverse Transfer Capacitance | C_{rss} | - | 8.88 | - | pF | |
| Gate Resistance | R_g | - | 275 | - | Ω | $V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$ |
| Total Gate Charge | Q_g | - | 0.6 | - | nC | $V_{GS} = -10\text{V}, I_D = -1\text{A}$ |
| Total Gate Charge | Q_g | - | 1.2 | - | nC | |
| Gate-Source Charge | Q_{gs} | - | 0.2 | - | nC | |
| Gate-Drain Charge | Q_{gd} | - | 0.3 | - | nC | |
| Turn-On Delay Time | $t_{D(on)}$ | - | 9.86 | - | ns | $V_{DS} = -15\text{V}, I_D = -1\text{A}, V_{GS} = -10\text{V}, R_G = 6\Omega$ |
| Turn-On Rise Time | t_r | - | 11.5 | - | ns | |
| Turn-Off Delay Time | $t_{D(off)}$ | - | 31.8 | - | ns | |
| Turn-Off Fall Time | t_f | - | 21.9 | - | ns | |

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

NEW PRODUCT

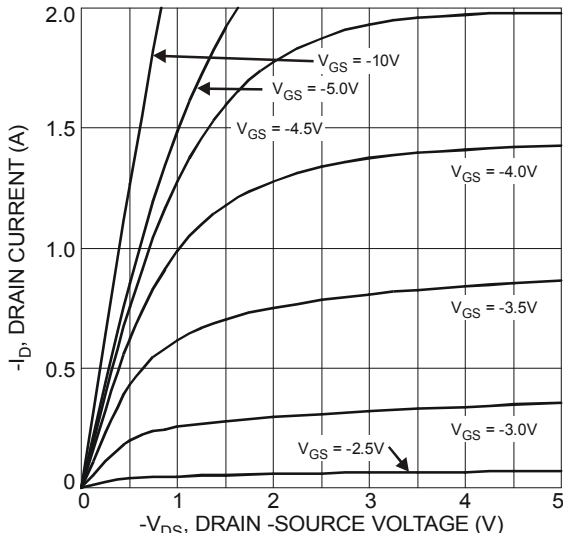


Figure 1 Typical Output Characteristics

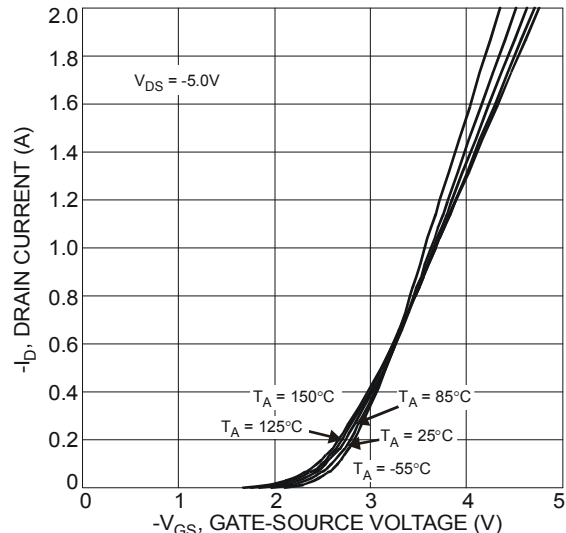


Figure 2 Typical Transfer Characteristics

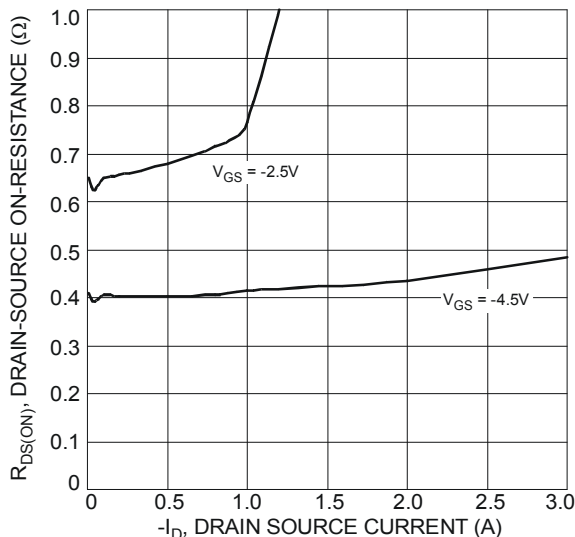


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

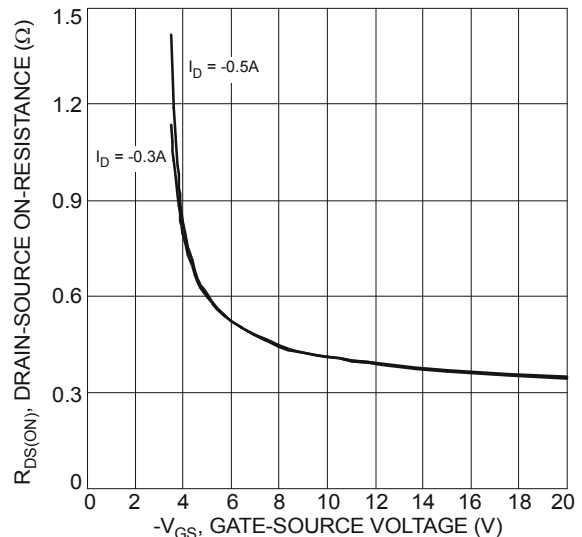


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

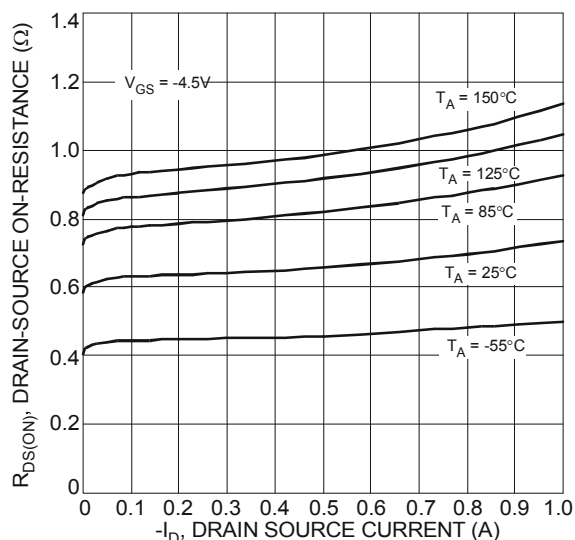


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

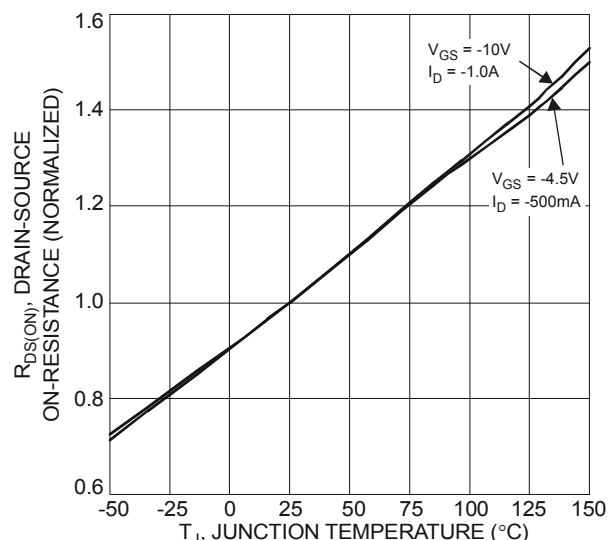


Figure 6 On-Resistance Variation with Temperature

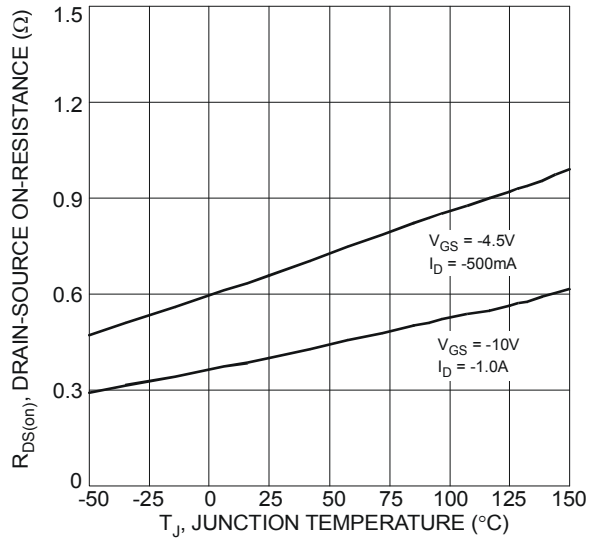


Figure 7 On-Resistance Variation with Temperature

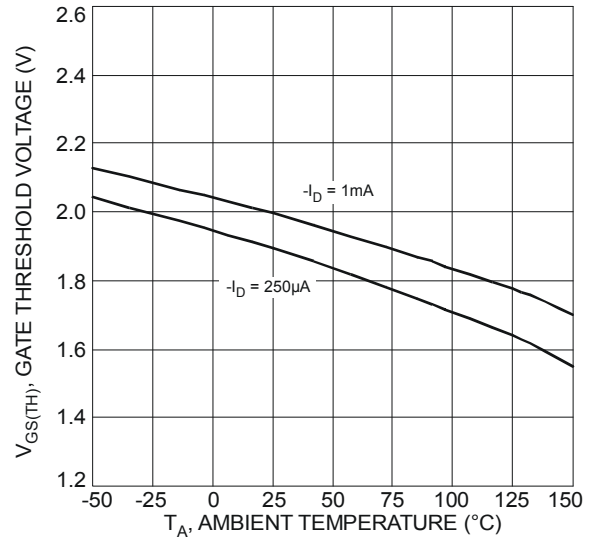


Figure 8 Gate Threshold Variation vs. Ambient Temperature

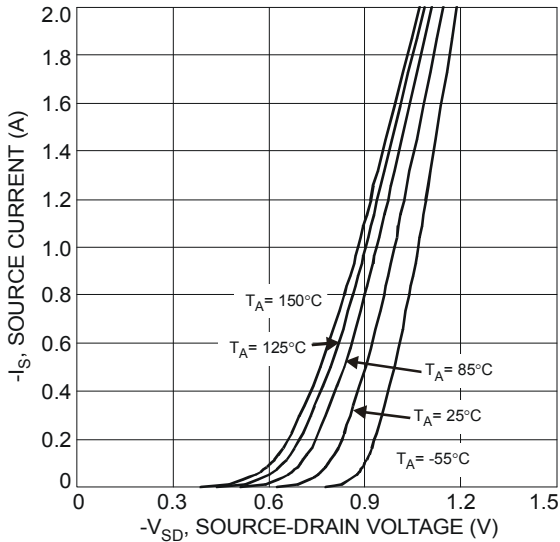


Figure 9 Diode Forward Voltage vs. Current

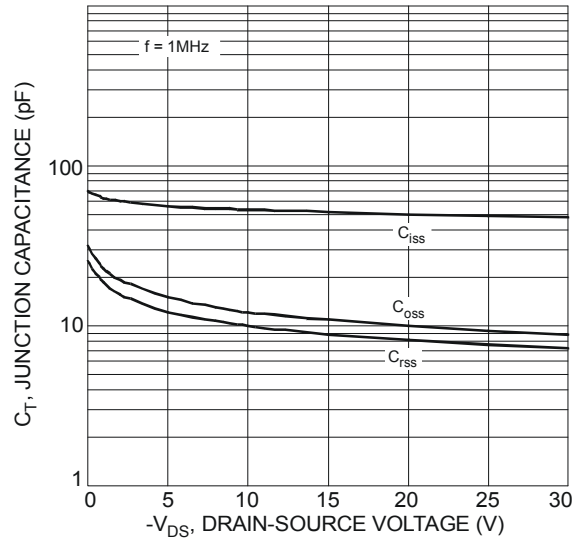


Figure 10 Typical Junction Capacitance

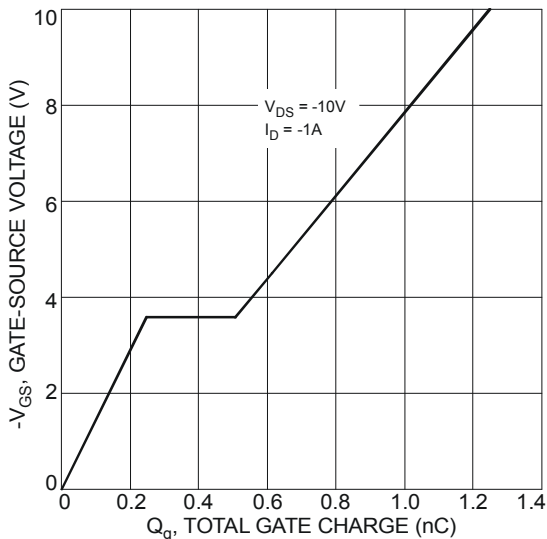
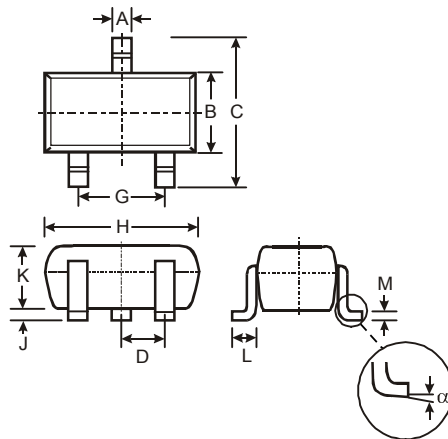


Figure 11 Gate-Charge Characteristics

Package Outline Dimensions

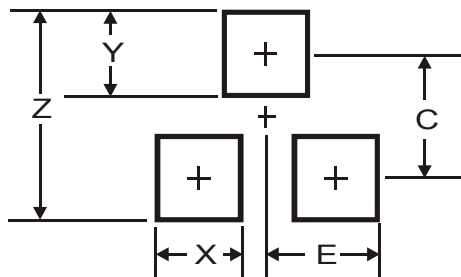
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT323 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.25 | 0.40 | 0.30 |
| B | 1.15 | 1.35 | 1.30 |
| C | 2.00 | 2.20 | 2.10 |
| D | - | - | 0.65 |
| G | 1.20 | 1.40 | 1.30 |
| H | 1.80 | 2.20 | 2.15 |
| J | 0.0 | 0.10 | 0.05 |
| K | 0.90 | 1.00 | 0.95 |
| L | 0.25 | 0.40 | 0.30 |
| M | 0.10 | 0.18 | 0.11 |
| 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 | 2.8 |
| X | 0.7 |
| Y | 0.9 |
| C | 1.9 |
| E | 1.0 |

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