

Product Summary

| | | |
|-------------------------|-------------------------------|--|
| BV_{DSS} | R_{DS(ON)} | I_D T _C = +25°C |
| -450V | 150Ω @ V _{GS} = -10V | -0.25A |

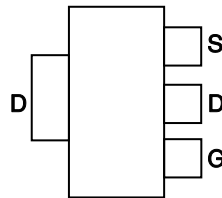
Description and Applications

This 450V enhancement mode P-channel MOSFET provides users with a competitive specification offering efficient power handling capability, high impedance and is free from thermal runaway and thermally induced secondary breakdown. Applications benefiting from this device include a variety of telecom and general high voltage switching circuits.

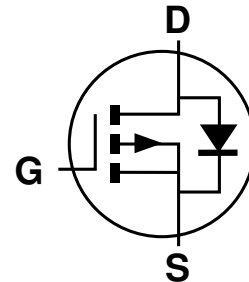
- Load switching
- Uninterrupted power supplies



Top View



Pin Out - Top View



Equivalent Circuit

Features and Benefits

- Low Gate Drive
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Package: SOT223
- Package 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: 0.112 grams (Approximate)

Ordering Information (Note 4)

| Part Number | Package | Packing | |
|-----------------|---------|---------|-------------|
| | | Qty. | Carrier |
| DMP45H150DHE-13 | SOT223 | 2,500 | 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



- DII = Manufacturer's Marking
- P450H2 = Product Type Marking Code
- YWW = Date Code Marking
- Y = Year (ex: 2 = 2022)
- WW = Week (01 to 53)

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

| Characteristic | Symbol | Value | Unit |
|---|------------------|---------------------------------|------|
| Drain-Source Voltage | V _{DSS} | -450 | V |
| Gate-Source Voltage | V _{GSS} | ±30 | V |
| Continuous Drain Current (Note 5) V _{GS} = -10V | I _D | T _C = +25°C -0.25 | A |
| | | T _C = +70°C -0.20 | |
| Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%) | I _{DM} | -0.45 | A |
| Maximum Body Diode Continuous Current | I _S | -0.25 | A |
| Avalanche Energy (Note 6) L = 60mH | E _{AS} | 2 | mJ |
| Avalanche Current (Note 6) L = 60mH | I _{AS} | 0.25 | A |
| Peak Diode Recovery dv/dt (I _{SD} ≤ 1.0A, di/dt ≤ 100A/µs) | dv/dt | 4.5 | V/ns |

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

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|--------------------------------|------|
| Total Power Dissipation (Note 6) | P _D | T _C = +25°C 13.9 | W |
| | | T _C = +70°C 8.9 | °C/W |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 59.4 | W |
| Thermal Resistance, Junction to Case | R _{θJC} | 8.9 | °C/W |
| 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 (Note 5) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | -450 | — | — | V | V _{GS} = 0V, I _D = -250µA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | -1 | µA | V _{DS} = -450V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±100 | nA | V _{GS} = ±30V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 5) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | -2.0 | -3.0 | -4.0 | V | V _{DS} = V _{GS} , I _D = -250µA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 40 | 150 | Ω | V _{GS} = -10V, I _D = -50mA |
| Diode Forward Voltage | V _{SD} | — | -0.8 | -1.2 | V | V _{GS} = 0V, I _S = -50mA |
| DYNAMIC CHARACTERISTICS (Note 6) | | | | | | |
| Input Capacitance | C _{iss} | — | 59.2 | — | pF | V _{DS} = -25V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 11 | — | | |
| Reverse Transfer Capacitance | C _{rss} | — | 1 | — | | |
| Forward Transconductance | g _{FS} | 40 | — | — | ms | V _{DS} = -25V, I _D = -50mA |
| Gate Resistance | R _G | — | 50 | — | Ω | V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz |
| Total Gate Charge | Q _G | — | 1.8 | — | nC | V _{DS} = -225V, I _D = -100mA V _{GS} = -10V |
| Gate-Source Charge | Q _{GS} | — | 0.3 | — | | |
| Gate-Drain Charge | Q _{GD} | — | 0.9 | — | | |
| Turn-On Delay Time | t _{D(ON)} | — | 12 | — | ns | V _{DD} = -225V, R _G = 3.0Ω I _D = -100mA |
| Turn-On Rise Time | t _R | — | 9 | — | | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 19 | — | | |
| Turn-Off Fall Time | t _F | — | 87 | — | | |
| Body Diode Reverse Recovery Time | t _{RR} | — | 108 | — | ns | V _{GS} = 0V, I _S = -1A, V _{DD} = -100V di/dt = 100A/µs |
| Body Diode Reverse Recovery Charge | Q _{RR} | — | 391 | — | nC | V _{GS} = 0V, I _S = -1A, V _{DD} = -100V di/dt = 100A/µs |

Notes: 5. Device mounted on FR-4 substrate PC board, 2oz copper, with 1 inch square copper pad layout.
6. Guaranteed by design. Not subject to production testing.

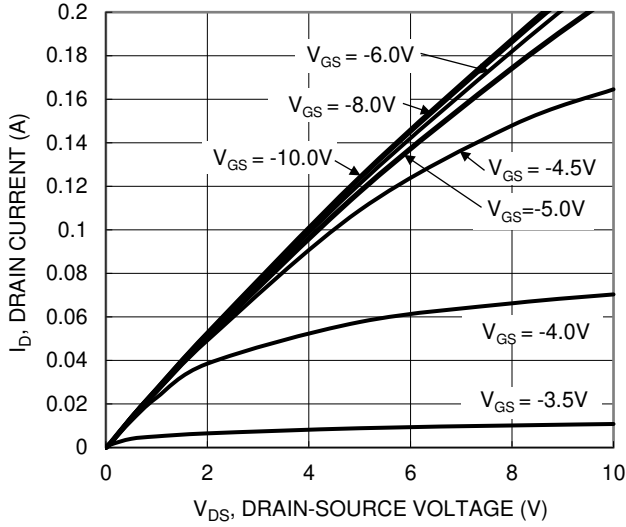


Figure 1. Typical Output Characteristic

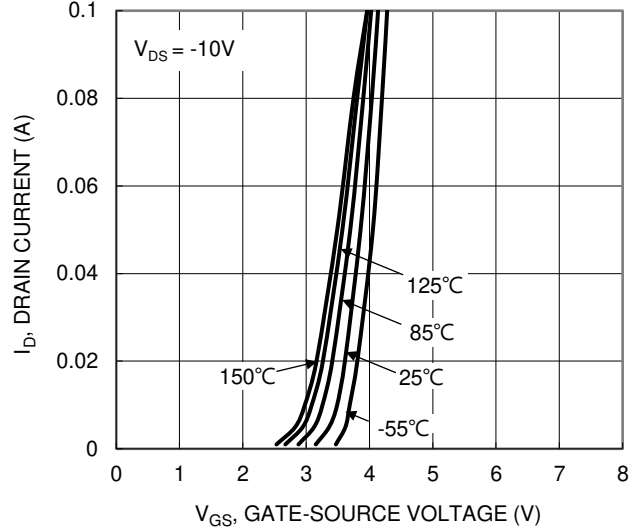


Figure 2. Typical Transfer Characteristic

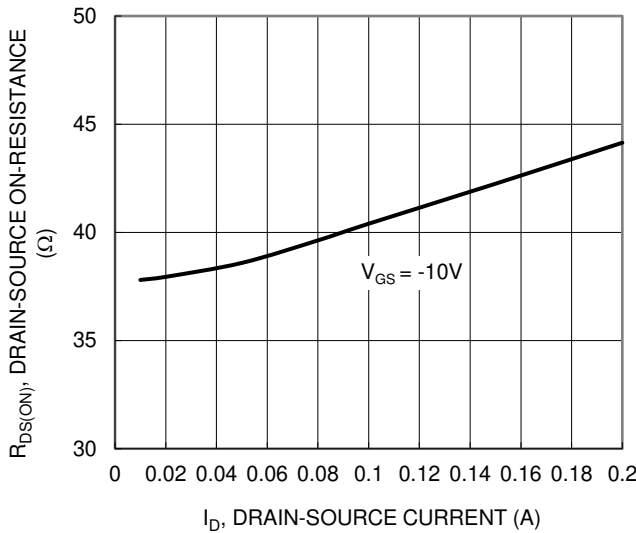


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

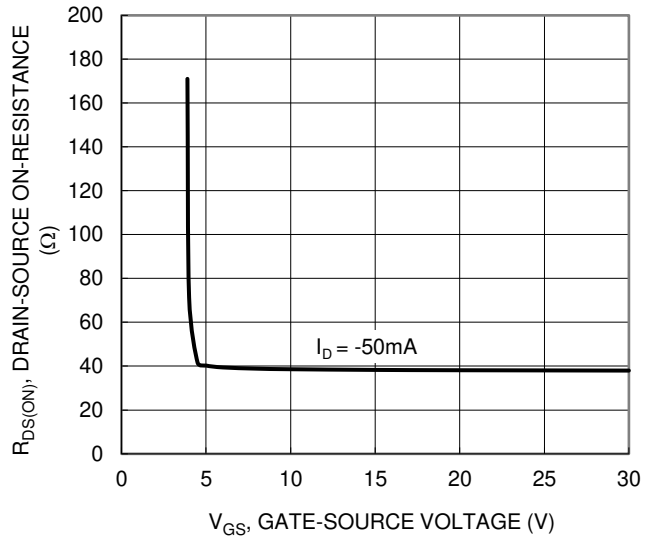


Figure 4. Typical Transfer Characteristic

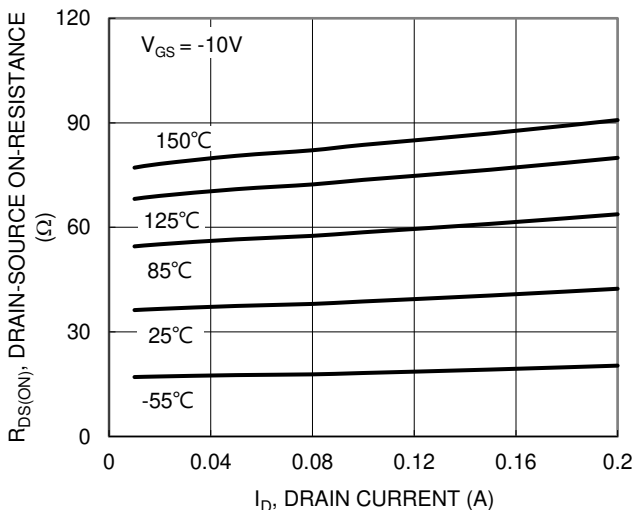


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

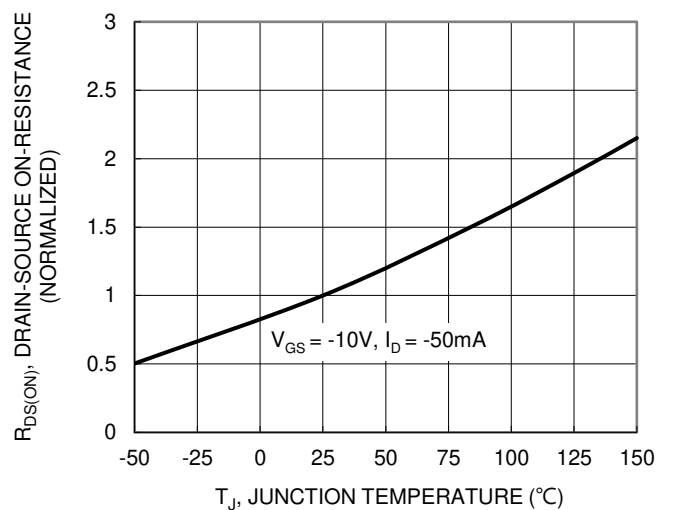


Figure 6. On-Resistance Variation with Temperature

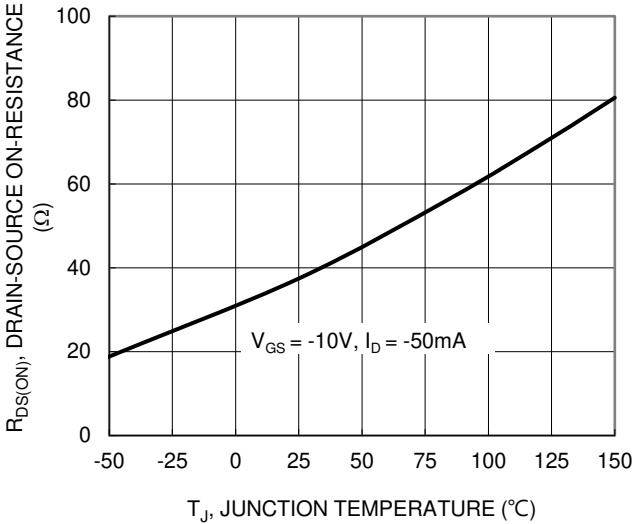


Figure 7. On-Resistance Variation with Temperature

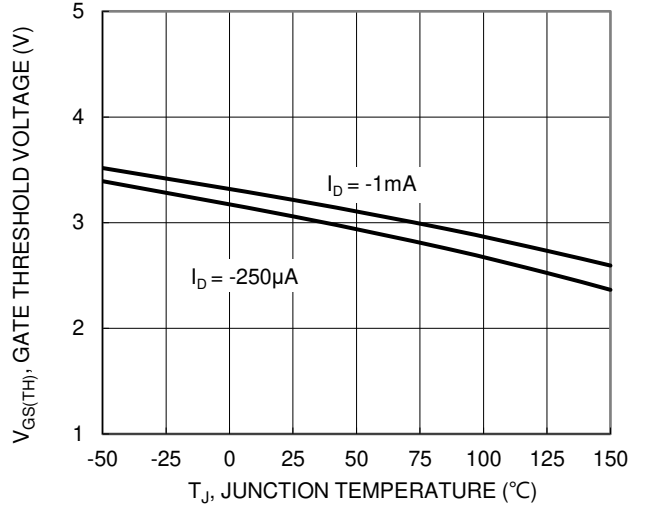


Figure 8. Gate Threshold Variation vs. Junction Temperature

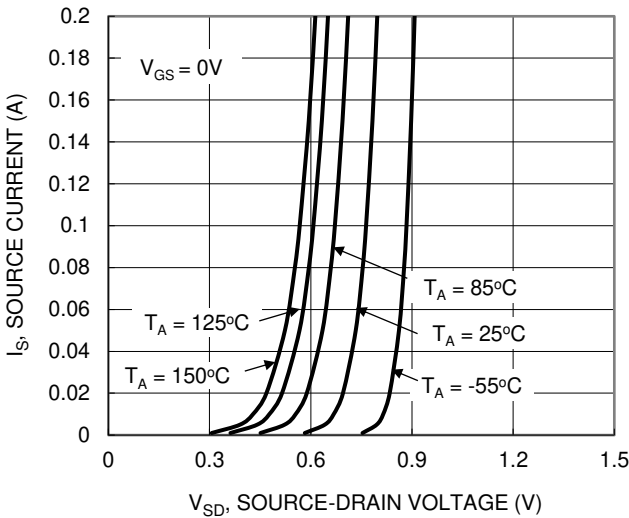


Figure 9. Diode Forward Voltage vs. Current

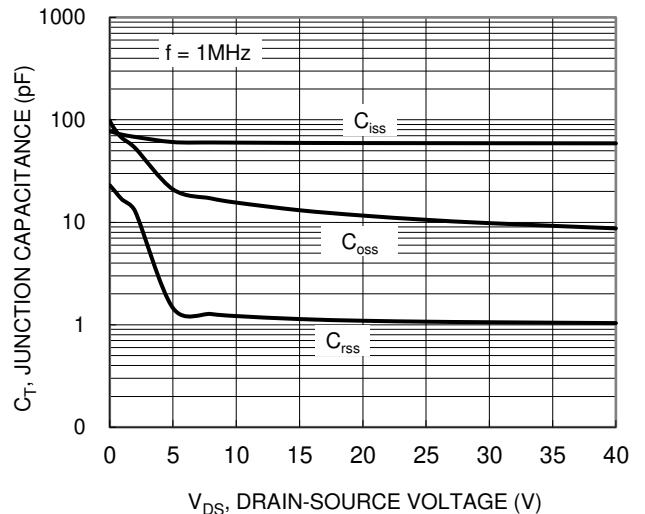


Figure 10. Typical Junction Capacitance

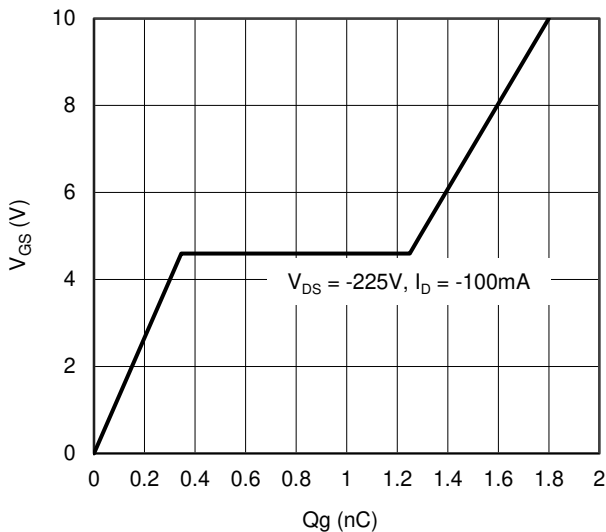


Figure 11. Gate Charge

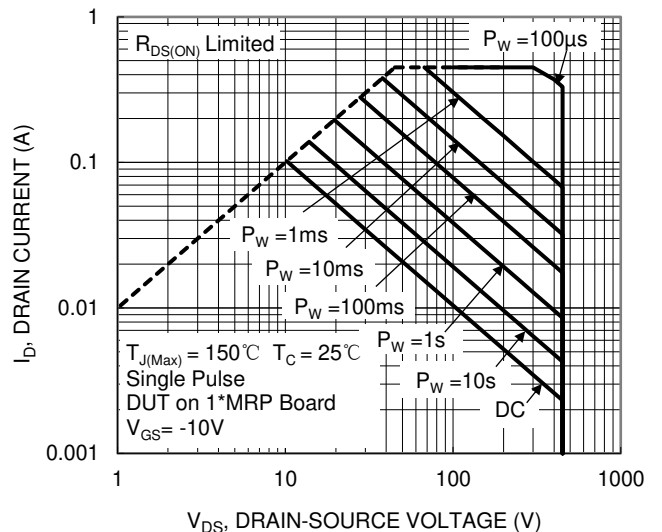
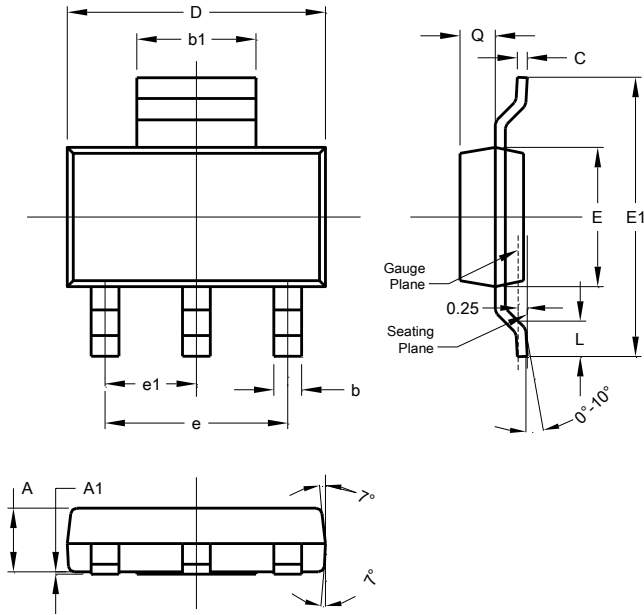


Figure 12. SOA, Safe Operation Area

Package Outline Dimensions

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

SOT223

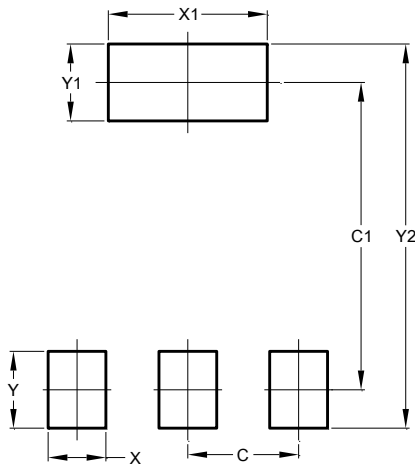


| SOT223 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 1.55 | 1.65 | 1.60 |
| A1 | 0.010 | 0.15 | 0.05 |
| b | 0.60 | 0.80 | 0.70 |
| b1 | 2.90 | 3.10 | 3.00 |
| C | 0.20 | 0.30 | 0.25 |
| D | 6.45 | 6.55 | 6.50 |
| E | 3.45 | 3.55 | 3.50 |
| E1 | 6.90 | 7.10 | 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 <http://www.diodes.com/package-outlines.html> for the latest version.

SOT223



| 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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