

## Product Summary

|                         |                                 |  |
|-------------------------|---------------------------------|--|
| <b>B<sub>V</sub>DSS</b> | <b>R<sub>DS(ON)</sub> Max</b>   | <b>I<sub>D</sub></b><br><b>T<sub>C</sub> = +25°C</b> |
| -20V                    | 100mΩ @ V <sub>GS</sub> = -4.5V | -1.5A  |

## Features and Benefits

- Low On-Resistance: R<sub>DS(ON)</sub>
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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)**

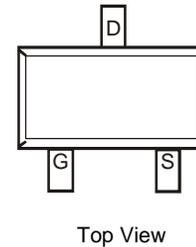
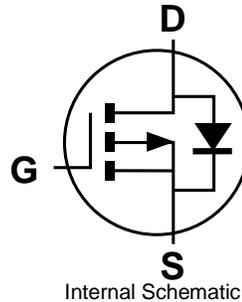
## Description and Applications

This MOSFET is designed to meet the stringent requirements of Automotive applications. It is qualified to AEC-Q101, supported by a PPAP and is ideal for use in:

- Engine Management Systems
- DC-DC Converters
- Body Control Electronics

## Mechanical Data

- Case: SOT323
- Case Material: Molded Plastic, "Green" Molding Compound.  
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish - Matte Tin Annealed over Alloy 42 Leadframe.  
Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

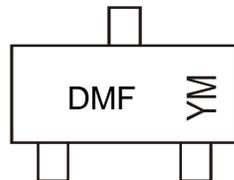


## Ordering Information (Note 5)

| Part Number  | Case   | Packaging         |
|--------------|--------|-------------------|
| DMP2160UWQ-7 | SOT323 | 3,000/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](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. Refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html)
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



DMF = Product Type Marking Code  
 YM = Date Code Marking  
 Y or  $\bar{Y}$  = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

### Date Code Key

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|------|------|------|
| Code | 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<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                      | Symbol           | Value                  | Units |
|-------------------------------------|------------------|------------------------|-------|
| Drain-Source Voltage                | V <sub>DSS</sub> | -20                    | V     |
| Gate-Source Voltage                 | V <sub>GSS</sub> | ±10                    | V     |
| Drain Current (Note 6) Steady State | I <sub>D</sub>   | T <sub>A</sub> = +25°C | -1.5  |
|                                     |                  | T <sub>A</sub> = +70°C | -1.2  |
| Pulsed Drain Current                | I <sub>DM</sub>  | -10                    | A     |

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                          | Symbol                            | Value       | Units |
|---|-----------------------------------|-------------|-------|
| Total Power Dissipation (Note 6)        | P <sub>D</sub>                    | 350         | mW    |
| Thermal Resistance, Junction to Ambient | R <sub>θJA</sub>                  | 360         | °C/W  |
| Operating and Storage Temperature Range | T <sub>J</sub> , T <sub>STG</sub> | -55 to +150 | °C    |

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Characteristic                          | Symbol              | Min  | Typ  | Max          | Unit | Test Condition  |
|---|---------------------|------|------|--------------|------|---|
| <b>OFF CHARACTERISTICS</b> (Note 7)     |                     |      |      |              |      |   |
| Drain-Source Breakdown Voltage          | BV <sub>DSS</sub>   | -20  | —    | —            | V    | V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA   |
| Zero Gate Voltage Drain Current         | I <sub>DSS</sub>    | —    | —    | 1            | μA   | V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V  |
| Gate-Source Leakage                     | I <sub>GSS</sub>    | —    | —    | ±100<br>±800 | nA   | V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V<br>V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V |
| <b>ON CHARACTERISTICS</b> (Note 7)      |                     |      |      |              |      |   |
| Gate Threshold Voltage                  | V <sub>GS(th)</sub> | -0.4 | -0.6 | -0.9         | V    | V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA                                 |
| Static Drain-Source On-Resistance       | R <sub>DS(on)</sub> | —    | 75   | 100          | mΩ   | V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1.5A   |
|   |                     |      | 90   | 120          |      | V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -1.2A   |
| Forward Transconductance                | g <sub>FS</sub>     | —    | 4    | —            | S    | V <sub>DS</sub> = -10V, I <sub>D</sub> = -1.5A  |
| Diode Forward Voltage (Note 8)          | V <sub>SD</sub>     | —    | —    | -1.0         | V    | V <sub>GS</sub> = 0V, I <sub>S</sub> = -1.0A  |
| <b>DYNAMIC CHARACTERISTICS</b> (Note 8) |                     |      |      |              |      |   |
| Input Capacitance                       | C <sub>ISS</sub>    | —    | 627  | —            | pF   | V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V<br>f = 1.0MHz                                  |
| Output Capacitance                      | C <sub>OSS</sub>    | —    | 64   | —            | pF   |   |
| Reverse Transfer Capacitance            | C <sub>RSS</sub>    | —    | 53   | —            | pF   |   |

Notes: 6. Device mounted on 1in<sup>2</sup> FR-4 PCB with 2 oz. Copper. t ≤ 10 sec.  
7. Short duration pulse test used to minimize self-heating effect.  
8. Guaranteed by design. Not subject to production testing.

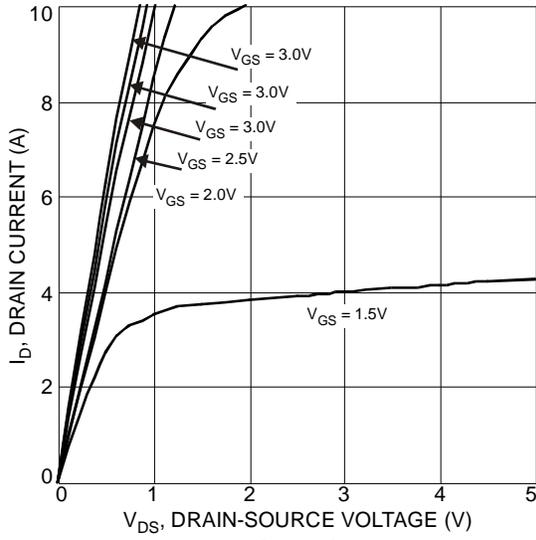


Fig. 1 Typical Output Characteristics

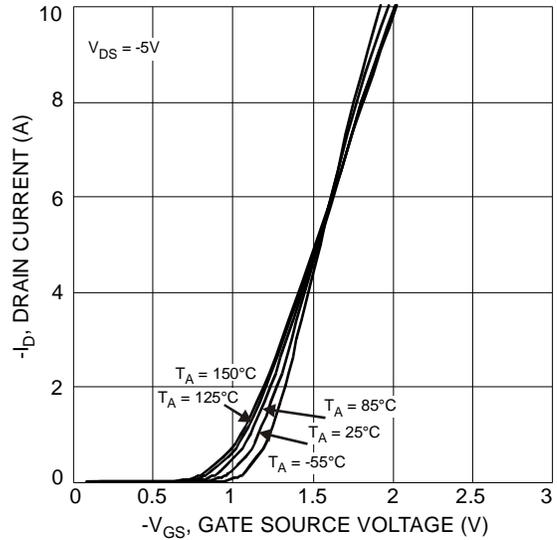


Fig. 2 Typical Transfer Characteristics

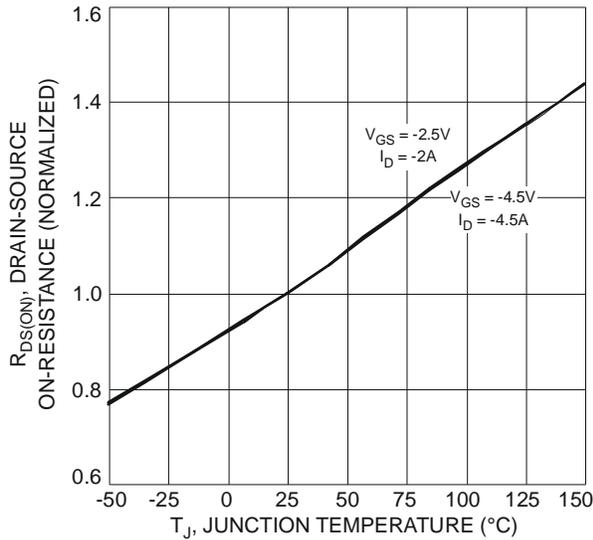


Fig. 3 On-Resistance Variation with Temperature

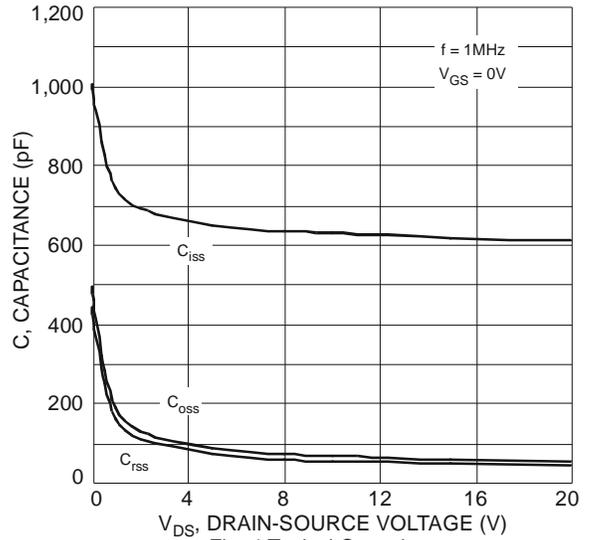


Fig. 4 Typical Capacitance

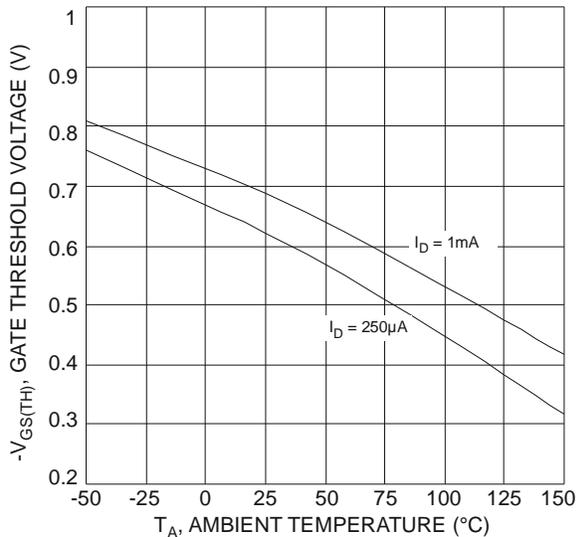


Fig. 5 Gate Threshold Variation vs. Ambient Temperature

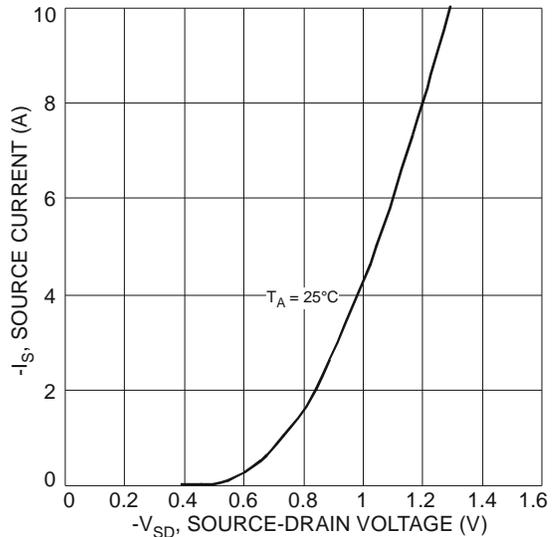


Fig. 6 Diode Forward Voltage vs. Current

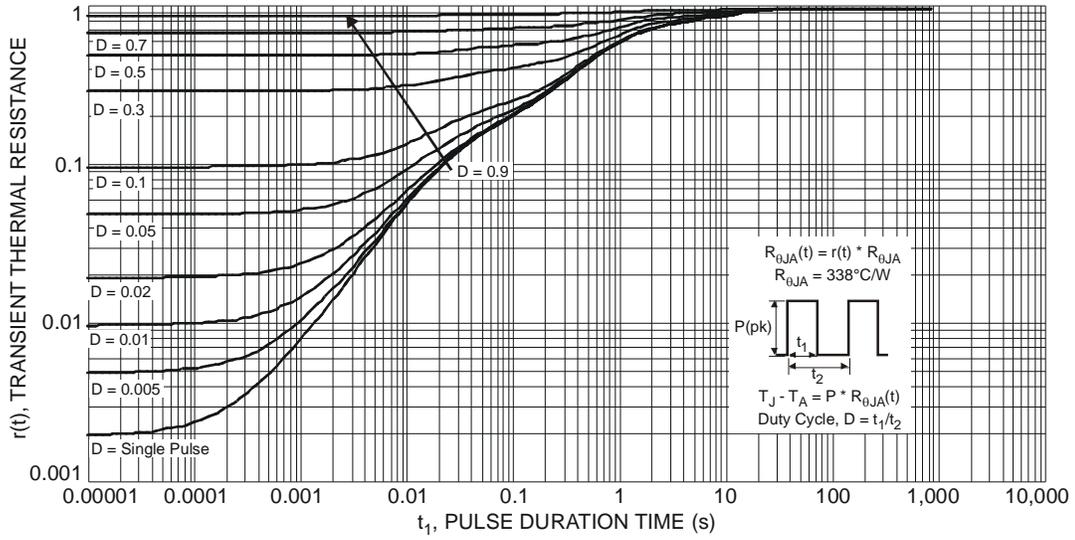
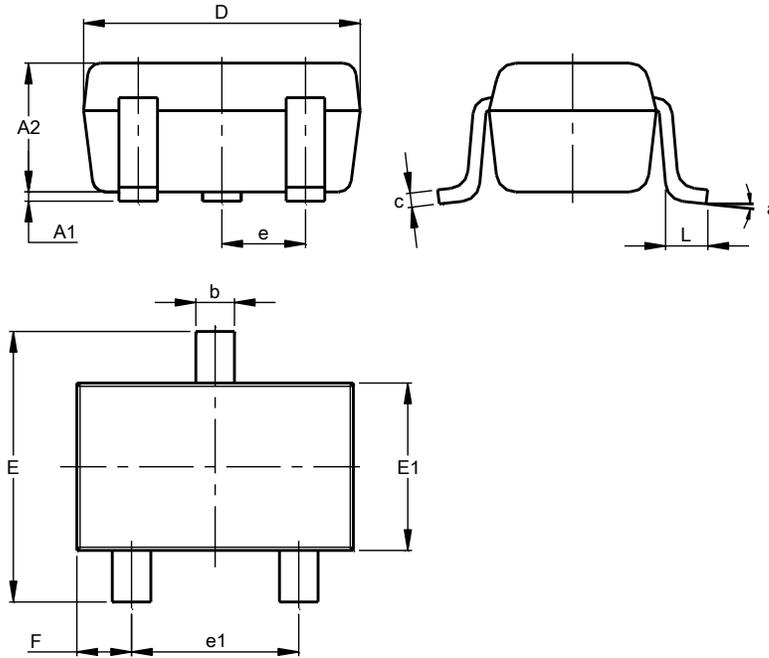


Fig. 7 Transient Thermal Response

**Package Outline Dimensions**

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

**SOT323**

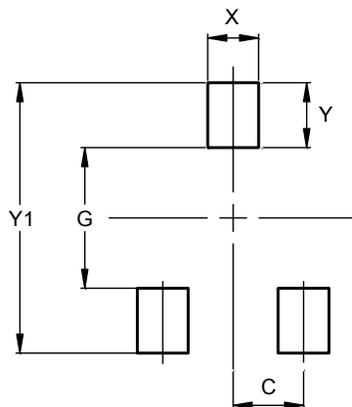


| SOT323               |           |       |       |
|----------------------|-----------|-------|-------|
| Dim                  | Min       | Max   | Typ   |
| A1                   | 0.00      | 0.10  | 0.05  |
| A2                   | 0.90      | 1.00  | 0.95  |
| b                    | 0.25      | 0.40  | 0.30  |
| c                    | 0.10      | 0.18  | 0.11  |
| D                    | 1.80      | 2.20  | 2.15  |
| E                    | 2.00      | 2.20  | 2.10  |
| E1                   | 1.15      | 1.35  | 1.30  |
| e                    | 0.650 BSC |       |       |
| e1                   | 1.20      | 1.40  | 1.30  |
| F                    | 0.375     | 0.475 | 0.425 |
| L                    | 0.25      | 0.40  | 0.30  |
| a                    | 0°        | 8°    | --    |
| All Dimensions in mm |           |       |       |

**Suggested Pad Layout**

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

**SOT323**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.650         |
| G          | 1.300         |
| X          | 0.470         |
| Y          | 0.600         |
| Y1         | 2.500         |

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