



**THE DATASHEET OF
DMN55D0UTQ-7**

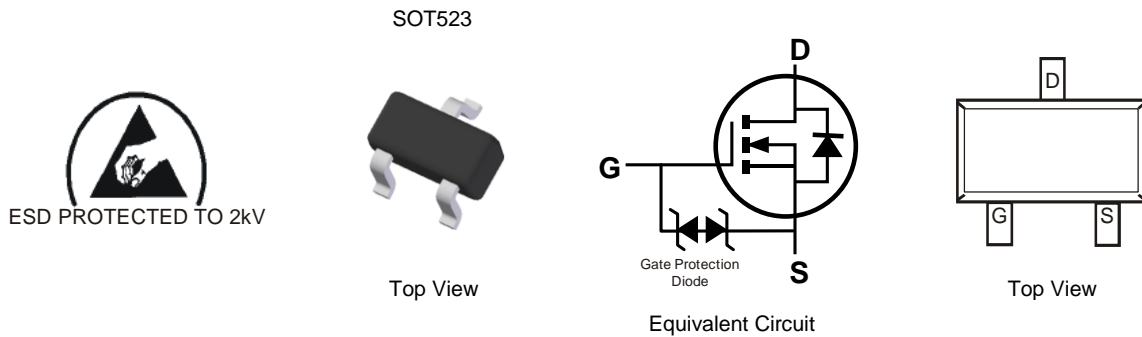


Features

- Low On-Resistance
- Very Low Gate Threshold Voltage
- Low Input Capacitance
- ESD Protected Gate to 2kV
- **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)**

Mechanical Data

- Case: SOT523
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Terminal Connections: See Diagram
- Weight: 0.002 grams (Approximate)

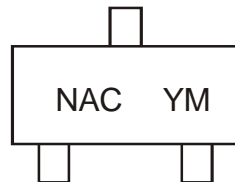


Ordering Information (Note 5)

| Part Number | Qualification | Case | Packaging |
|--------------|---------------|--------|-------------------|
| DMN55D0UT-7 | Commercial | SOT523 | 3,000/Tape & Reel |
| DMN55D0UTQ-7 | Automotive | SOT523 | 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. 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 <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



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

Date Code Key

| Year | 2007 | --- | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|------|------|-----|------|------|------|------|------|------|------|------|------|
| Code | U | --- | C | D | E | F | G | H | I | J | K |

| 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} | 50 | V |
| Gate-Source Voltage | V _{GSS} | ±12 | V |
| Drain Current (Note 6) Continuous | I _D | 160 | mA |
| Pulsed Drain Current (Note 6) | I _{DM} | 560 | mA |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 6) | P _D | 200 | mW |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 625 | °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 7) | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | 50 | — | — | V | V _{GS} = 0V, I _D = 250μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1 | μA | V _{DS} = 50V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | 5.0 | μA | V _{GS} = ±8V, V _{DS} = 0V V _{GS} = ±12V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 0.7 | 0.8 | 1.0 | V | V _{DS} = V _{GS} , I _D = 250μA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | 3.1 | 4 | Ω | V _{GS} = 4V, I _D = 100mA |
| | | — | 4 | 5 | | V _{GS} = 2.5V, I _D = 80mA |
| Forward Transconductance | g _{FS} | 180 | — | — | mS | V _{DS} = 10V, I _D = 100mA, f = 1.0kHz |
| Diode Forward Voltage | V _{SD} | — | 0.70 | 1.3 | V | V _{GS} = 0V, I _S = 100mA |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iss} | — | 25 | — | pF | V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz |
| Output Capacitance | C _{oss} | — | 5 | — | pF | |
| Reverse Transfer Capacitance | C _{rss} | — | 2.1 | — | pF | |
| Gate Resistance | R _G | — | 500 | — | Ω | f = 1MHz, V _{GS} = 0V, V _{DS} = 0V |
| Total Gate Charge (V _{GS} = 4V) | Q _G | — | 295 | — | pC | V _{DS} = 10V, I _D = 100mA |
| Total Gate Charge (V _{GS} = 8V) | Q _G | — | 636 | — | pC | |
| Gate-Source Charge | Q _{GS} | — | 72 | — | pC | |
| Gate-Drain Charge | Q _{GD} | — | 18 | — | pC | |
| Turn-On Delay Time | t _{D(ON)} | — | 6.0 | — | ns | V _{DD} = 10V, V _{GS} = 4V, R _G = 25Ω, I _D = 100mA |
| Turn-On Rise Time | t _R | — | 4.4 | — | ns | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 23.4 | — | ns | |
| Turn-Off Fall Time | t _F | — | 11.0 | — | ns | |

- Notes: 6. Device mounted on FR-4 PCB, with minimum recommended pad layout.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

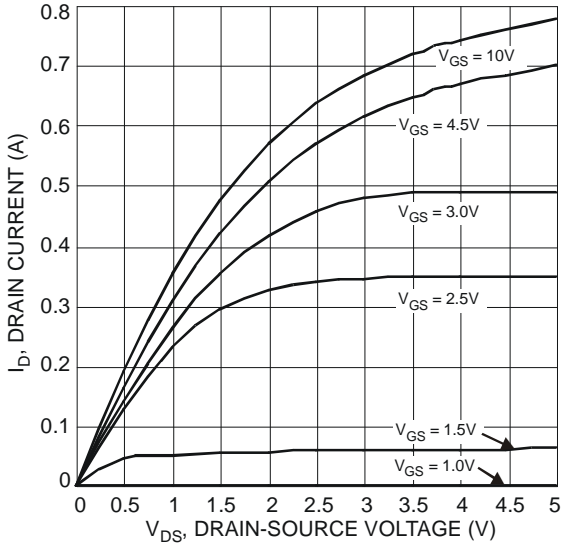


Fig. 1 Typical Output Characteristics

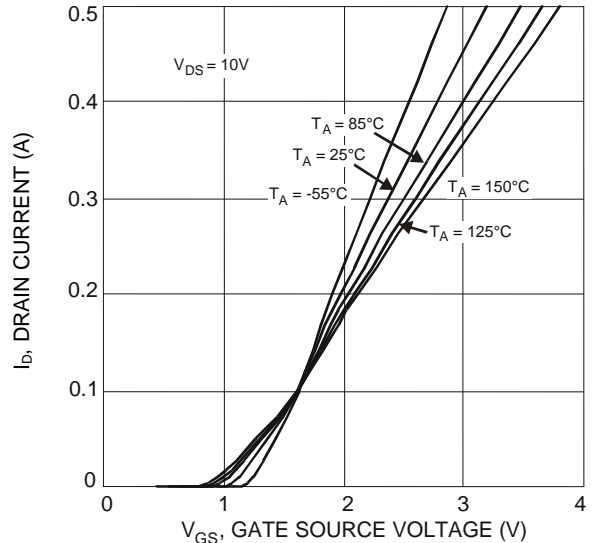


Fig. 2 Typical Transfer Characteristics

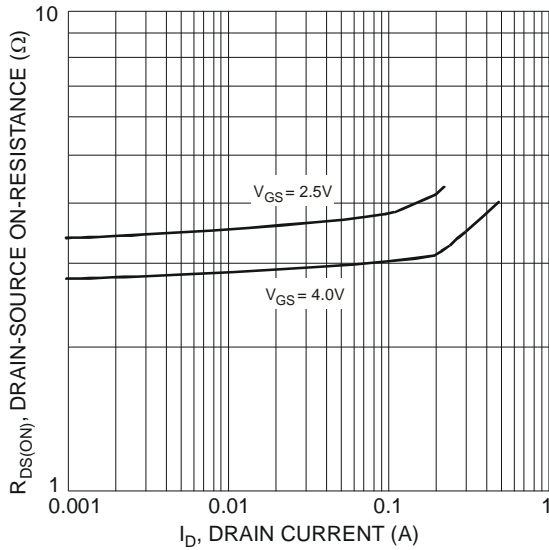


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

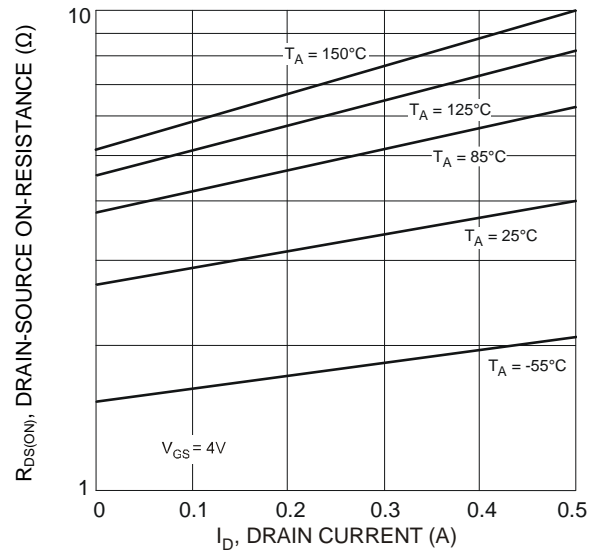


Fig. 4 Typical Drain-Source On-Resistance vs. Drain Current and Temperature

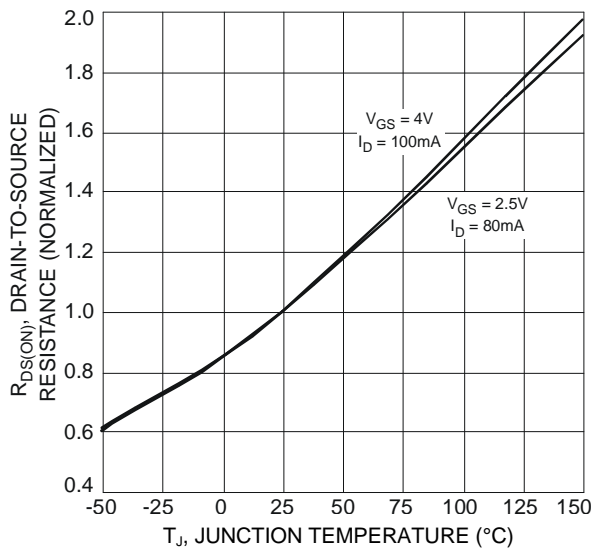


Fig. 5 On-Resistance Variation with Temperature

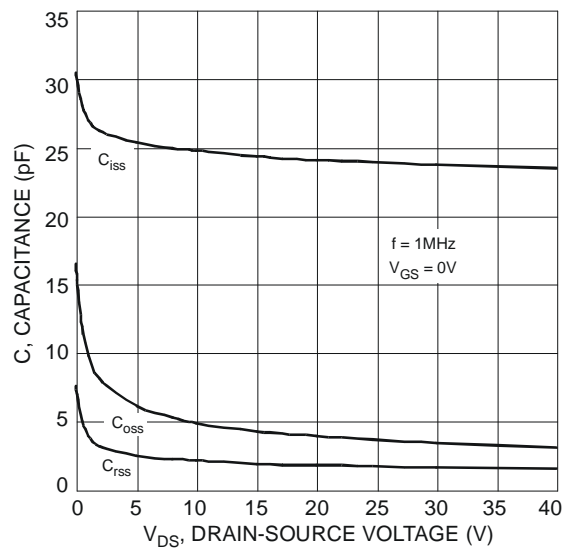


Fig. 6 Typical Capacitance

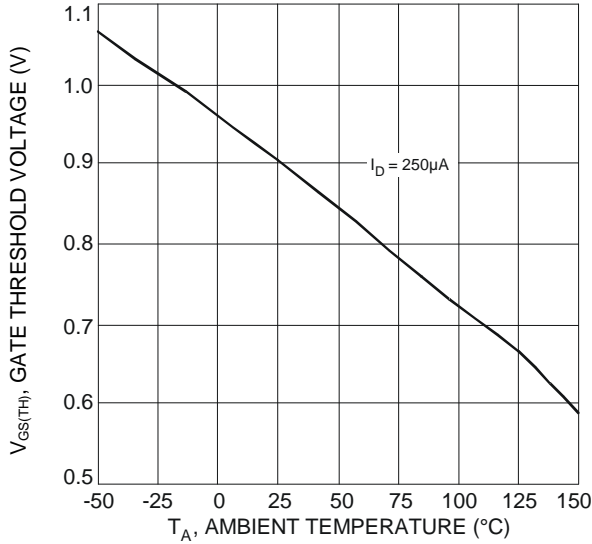


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

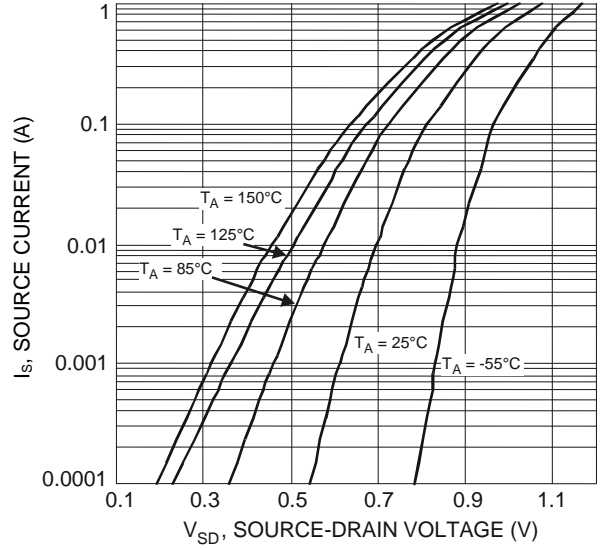


Fig. 8 Diode Forward Voltage vs. Current

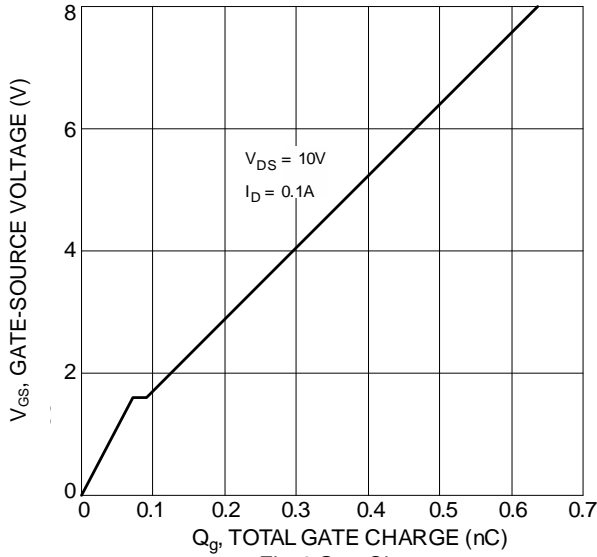


Fig. 9 Gate Charge

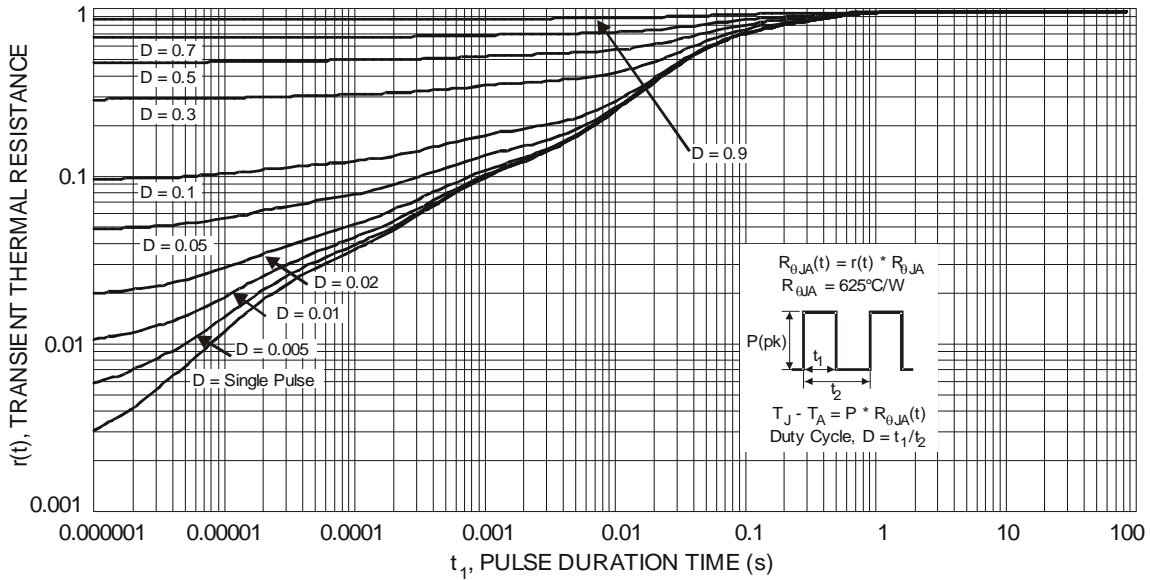
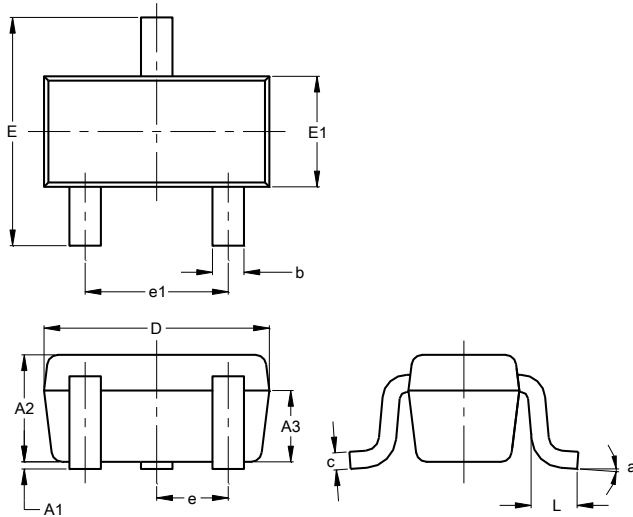


Fig. 10 Transient Thermal Response

Package Outline Dimensions

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

SOT523

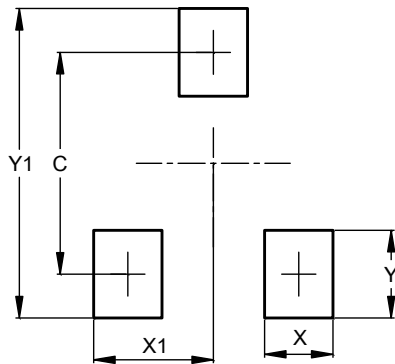


| SOT523 | | | |
|-----------------------------|----------|------|------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.60 | 0.80 | 0.75 |
| A3 | 0.45 | 0.65 | 0.50 |
| b | 0.15 | 0.30 | 0.22 |
| c | 0.10 | 0.20 | 0.12 |
| D | 1.50 | 1.70 | 1.60 |
| E | 1.45 | 1.75 | 1.60 |
| E1 | 0.75 | 0.85 | 0.80 |
| e | 0.50 BSC | | |
| e1 | 0.90 | 1.10 | 1.00 |
| L | 0.20 | 0.40 | 0.33 |
| a | 0° | -- | 8° |
| All Dimensions in mm | | | |

Suggested Pad Layout

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

SOT523



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.29 |
| X | 0.40 |
| X1 | 0.70 |
| Y | 0.51 |
| Y1 | 1.80 |

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