

Product Summary

| $V_{(BR)DSS}$ | $R_{DS(ON)}$ max | I_D max $T_A = +25^\circ\text{C}$ |
|---------------|----------------------------|--|
| 60V | 2Ω @ $V_{GS} = 10\text{V}$ | 250mA |
| | 3Ω @ $V_{GS} = 5\text{V}$ | |

Description

This MOSFET is 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

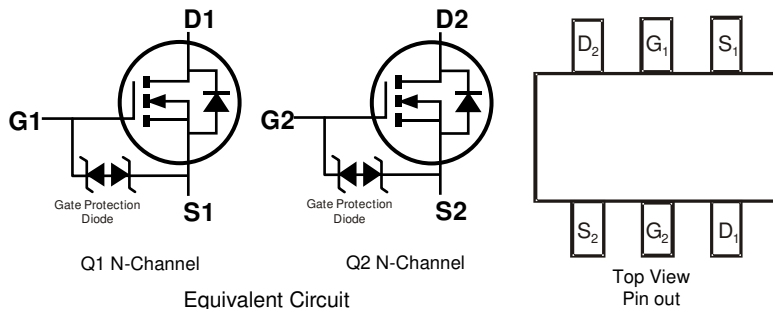
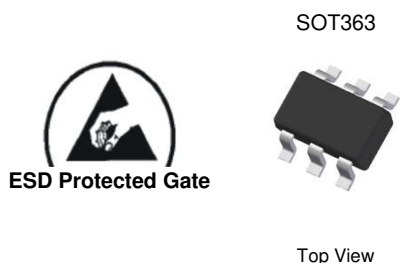
- Motor Control
- Power Management Functions

Features

- Dual N-Channel MOSFET
- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Ultra-Small Surface Mount Package
- **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: SOT363
- 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 (Lead Free Plating). Solderable per MIL-STD-202, Method 208 (e3)
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

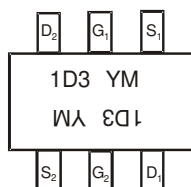


Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---------------|--------|-------------------|
| DMN63D1LDW-7 | SOT363 | 3000/Tape & Reel |
| DMN63D1LDW-13 | SOT363 | 10000/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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



1D3 = Product Type Marking Code
 YM = Date Code Marking
 Y or Y = Year (ex: B = 2014)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | B | C | D | E | F | G | H | I | J | K | L | M |
| 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} | 60 | V |
| Gate-Source Voltage | V _{GSS} | ±20 | V |
| Continuous Drain Current (Note 6) V _{GS} = 10V | I _D | Steady State T _A = +25°C | 250 |
| | | T _A = +70°C | 200 |
| Maximum Continuous Body Diode Forward Current (Note 6) | I _S | 0.5 | A |
| Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%) (Note 6) | I _{DM} | 1.2 | A |

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

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Total Power Dissipation (Note 5) | P _D | 310 | mW |
| Thermal Resistance, Junction to Ambient (Note 5) | R _{θJA} | 414 | °C/W |
| Total Power Dissipation (Note 6) | P _D | 390 | mW |
| Thermal Resistance, Junction to Ambient (Note 6) | R _{θJA} | 324 | °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} | 60 | — | — | V | V _{GS} = 0V, I _D = 10μA |
| Zero Gate Voltage Drain Current | I _{DSS} | — | — | 1.0 | μA | V _{DS} = 60V, V _{GS} = 0V |
| Gate-Source Leakage | I _{GSS} | — | — | ±10 | μA | V _{GS} = ±20V, V _{DS} = 0V |
| ON CHARACTERISTICS (Note 7) | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | 1.0 | 1.6 | 2.5 | V | V _{DS} = 10V, I _D = 1mA |
| Static Drain-Source On-Resistance | R _{DS(ON)} | — | — | 2.0 3.0 | Ω | V _{GS} = 10V, I _D = 0.5A V _{GS} = 5V, I _D = 0.05A |
| Forward Transfer Admittance | Y _{fs} | 80 | — | — | mS | V _{DS} = 10V, I _D = 0.2A |
| Diode Forward Voltage | V _{SD} | — | 0.75 | 1.1 | V | V _{GS} = 0V, I _S = 115mA |
| DYNAMIC CHARACTERISTICS (Note 8) | | | | | | |
| Input Capacitance | C _{iSS} | — | 30 | — | pF | V _{DS} = 25V, V _{GS} = 0V f = 1.0MHz |
| Output Capacitance | C _{oSS} | — | 4.2 | — | pF | |
| Reverse Transfer Capacitance | C _{rSS} | — | 2.9 | — | pF | |
| Gate Resistance | R _g | — | 133 | — | Ω | f = 1MHz, V _{GS} = 0V, V _{DS} = 0V |
| Total Gate Charge | Q _g | — | 304 | — | pC | V _{GS} = 4.5V, V _{DS} = 10V, I _D = 250mA |
| Gate-Source Charge | Q _{gs} | — | 203 | — | pC | |
| Gate-Drain Charge | Q _{gd} | — | 84 | — | pC | |
| Turn-On Delay Time | t _{D(ON)} | — | 3.9 | — | ns | V _{DD} = 30V, V _{GS} = 10V, R _G = 25Ω, I _D = 200mA |
| Turn-On Rise Time | t _R | — | 3.4 | — | ns | |
| Turn-Off Delay Time | t _{D(OFF)} | — | 15.7 | — | ns | |
| Turn-Off Fall Time | t _F | — | 9.9 | — | ns | |

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
 - Device mounted on 1" x 1" FR-4 PCB with high coverage 2oz. Copper, single sided.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

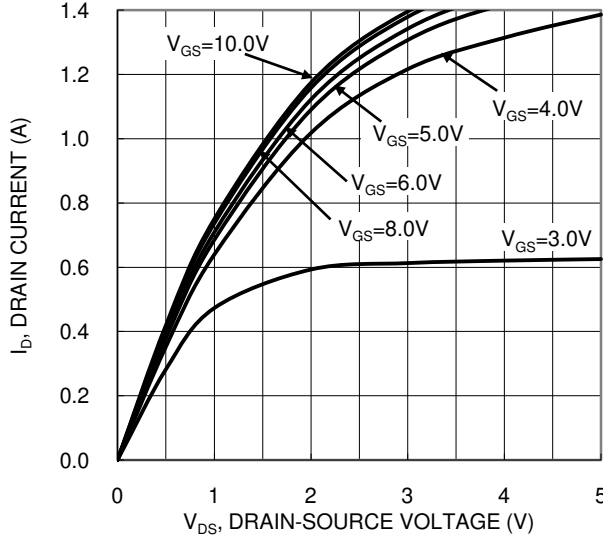


Figure 1. Typical Output Characteristic

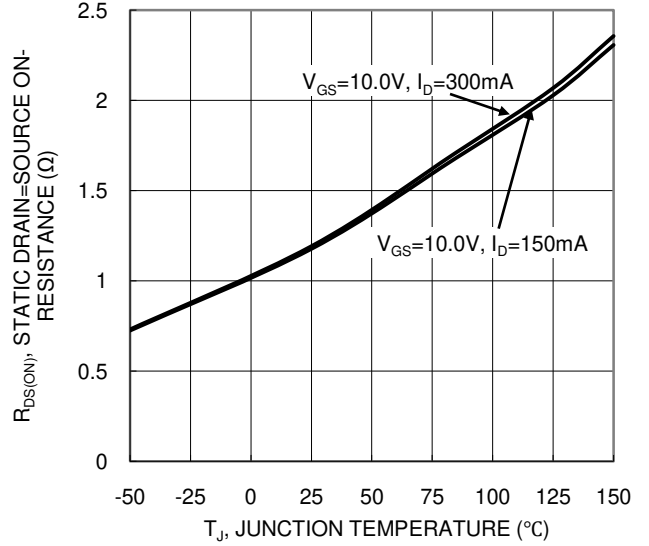


Figure 2. On-Resistance Variation with Temperature

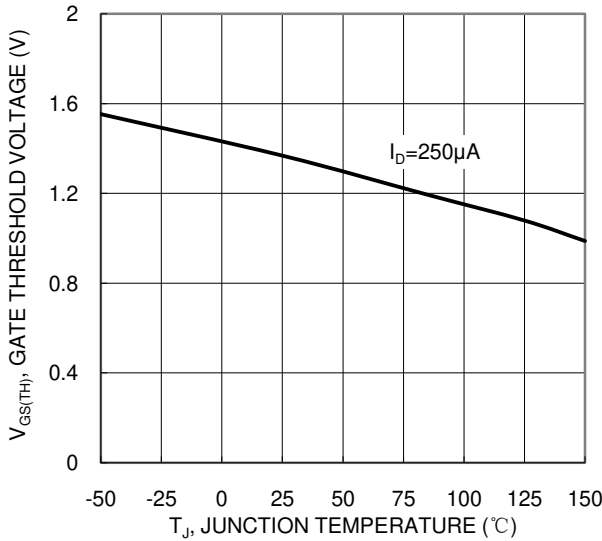


Figure 3. Gate Threshold Variation with Temperature

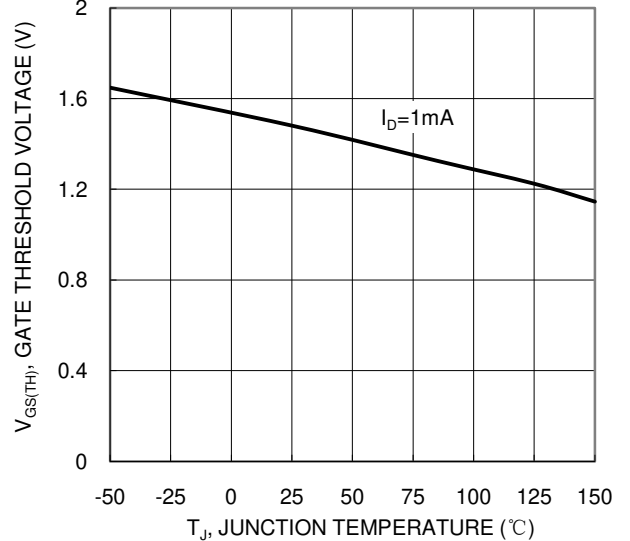


Figure 4. Gate Threshold Variation with Temperature

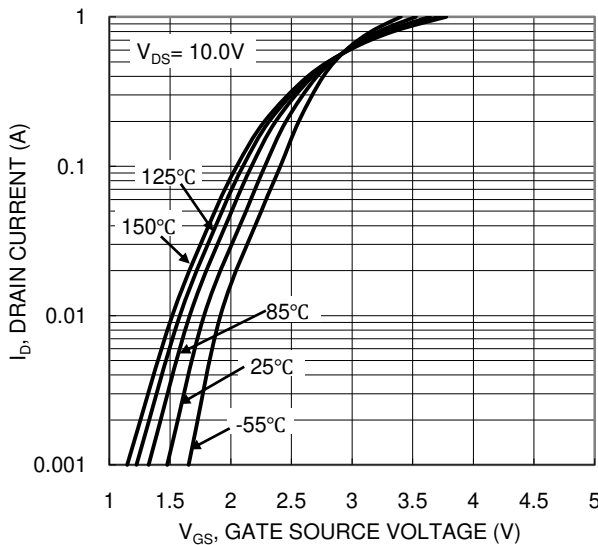


Figure 5. Typical Transfer Characteristics

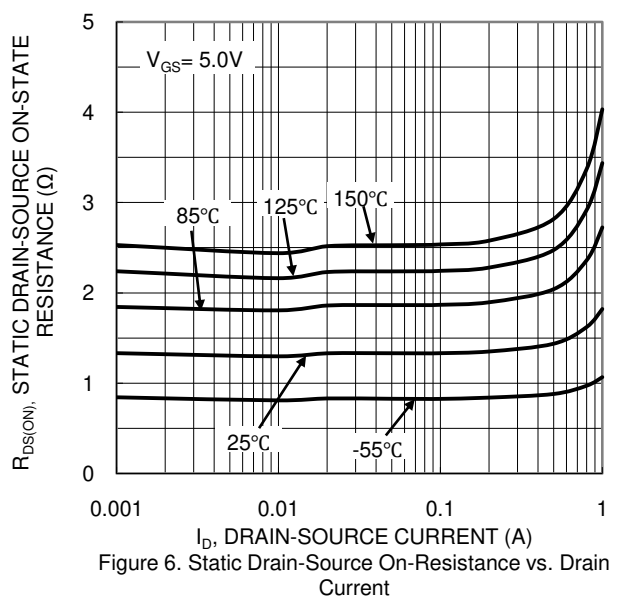


Figure 6. Static Drain-Source On-Resistance vs. Drain Current

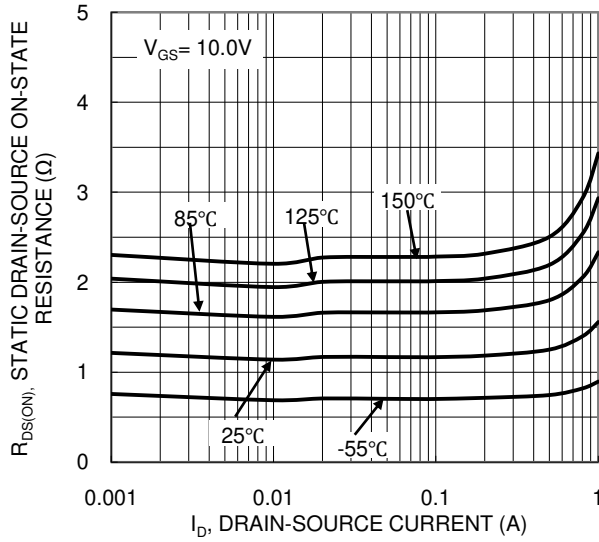


Figure 7. Static Drain-Source On-Resistance vs. Drain Current

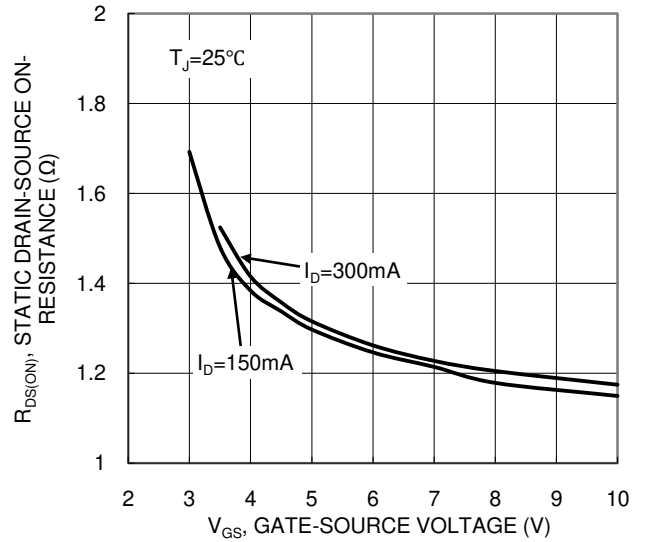


Figure 8. Static Drain-Source On-Resistance vs. Gate-Source Voltage

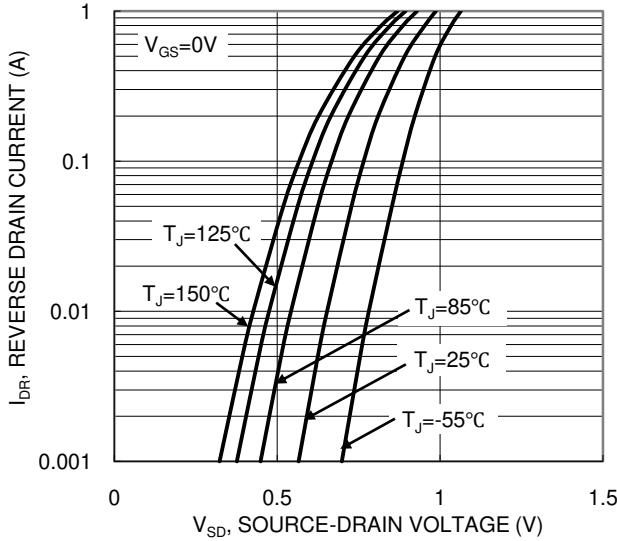


Figure 9. Reverse Drain Current

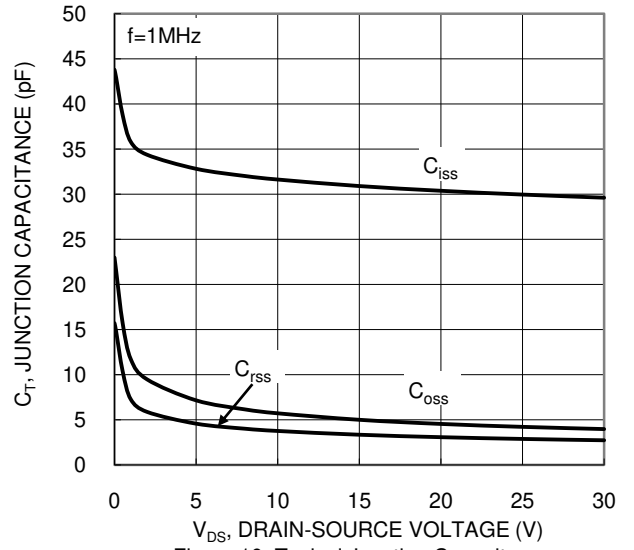


Figure 10. Typical Junction Capacitance

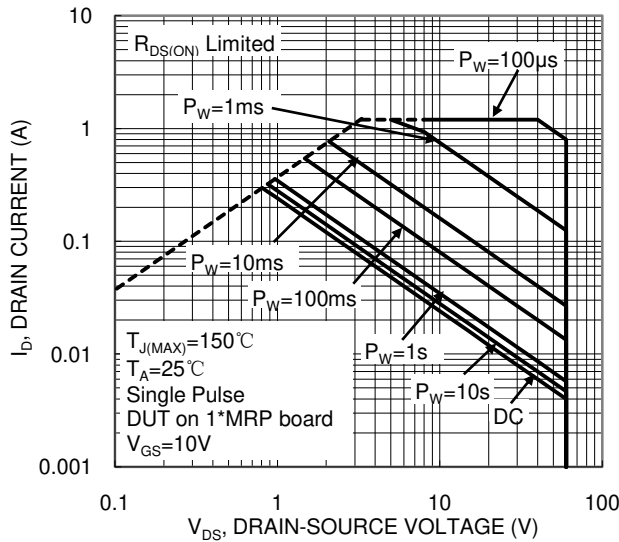
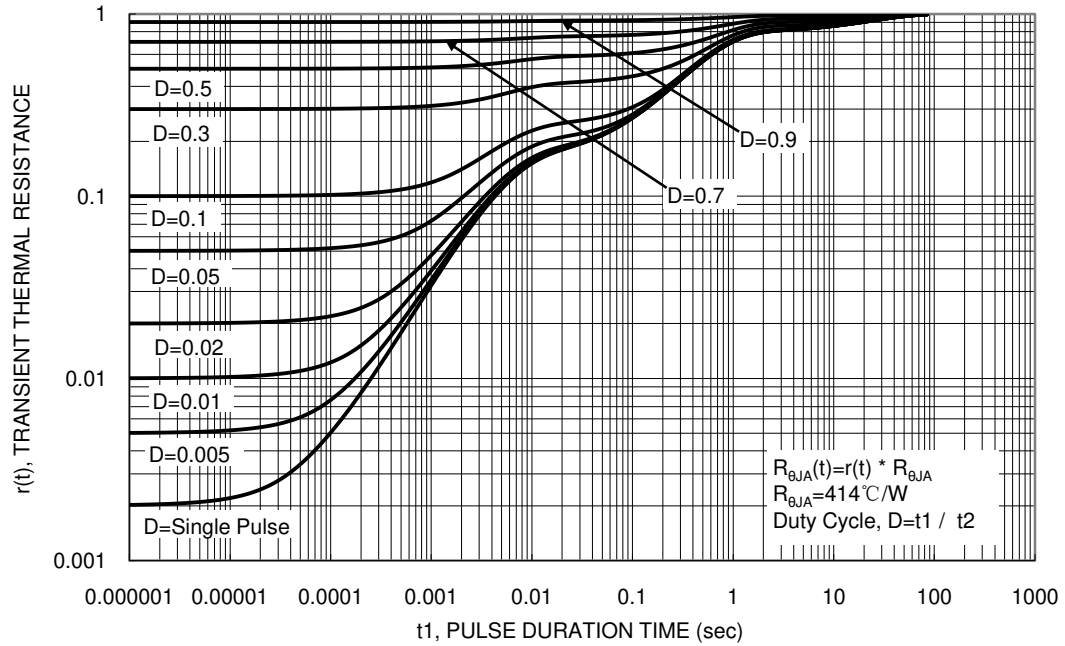
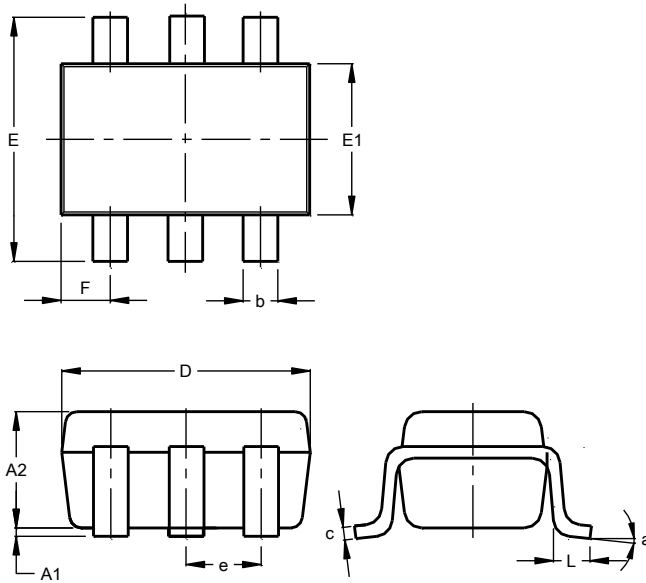


Figure 11. SOA, Safe Operation Area



Package Outline Dimensions

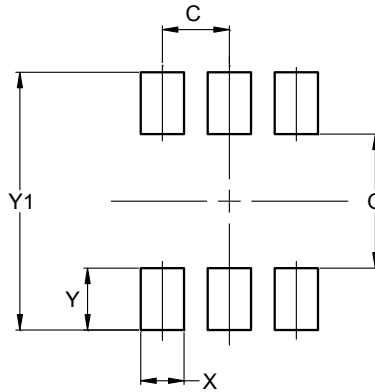
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOT363 | | | |
|----------------------|-----------|------|-------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.90 | 1.00 | 1.00 |
| b | 0.10 | 0.30 | 0.25 |
| c | 0.10 | 0.22 | 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 | | |
| F | 0.40 | 0.45 | 0.425 |
| L | 0.25 | 0.40 | 0.30 |
| a | 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) |
|------------|---------------|
| C | 0.650 |
| G | 1.300 |
| X | 0.420 |
| Y | 0.600 |
| Y1 | 2.500 |

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