




**THE DATASHEET OF  
SDM40E20LS-7-F**



## Features

- Very Low Forward Voltage Drop
- Guard Ring Construction for Transient Protection
- High Conductance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([SDM40E20LSQ/AQ](#))**

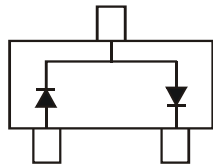
## Mechanical Data

- Package: SOT23
- Package Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Polarity: See Diagram
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 
- Weight: 0.008 grams (Approximate)

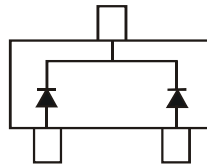
SOT23 (Standard)



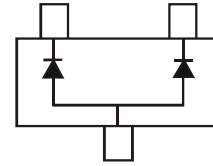
Top View



SDM40E20LS



SDM40E20LC



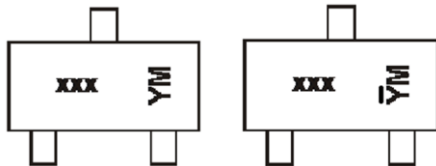
SDM40E20LA

## Ordering Information (Note 4)

| Part Number    | Package          | Packing |             |
|----------------|------------------|---------|-------------|
|                |                  | Qty.    | Carrier     |
| SDM40E20LS-7-F | SOT23 (Standard) | 3,000   | Tape & Reel |
| SDM40E20LC-7   | SOT23 (Standard) | 3,000   | Tape & Reel |
| SDM40E20LA-7   | SOT23 (Standard) | 3,000   | Tape & Reel |

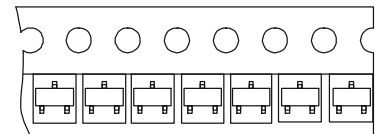
- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



xxx = Product Type Marking Code  
 KSW = SDM40E20LS  
 KWS = SDM40E20LC  
 KWA = SDM40E20LA

YM &  $\bar{Y}M$  = Date Code Marking  
 Y &  $\bar{Y}$  = Year (ex: J = 2022)  
 M = Month (ex: D = Dec)



### Date Code Key

| Year | 2002 | ... | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | O    | ... | J    | K    | L    | M    | N    | O    | P    | R    | S    | T    |

| 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.

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitive load, derate current by 20%.

| Characteristic  | Symbol              | Value | Unit |
|---|---------------------|-------|------|
| Peak Repetitive Reverse Voltage   | V <sub>RRM</sub>    | 20    | V    |
| Working Peak Reverse Voltage  | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage   | V <sub>R</sub>      |       |      |
| RMS Reverse Voltage   | V <sub>R(RMS)</sub> | 14    | V    |
| Forward Continuous Current (Note 5)   | I <sub>FM</sub>     | 0.4   | A    |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single Half Sine-Wave Superimposed On Rated Load | I <sub>FSM</sub>    | 2     | A    |

### Thermal Characteristics

| Characteristic  | Symbol                            | Value       | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation (Note 5)<br>(Note 6)                              | P <sub>D</sub>                    | 225         | mW   |
|   |                                   | 300         |      |
| Typical Thermal Resistance Junction to Ambient (Note 5)<br>(Note 6) | R <sub>θJA</sub>                  | 444         | °C/W |
|   |                                   | 333         |      |
| Operating and Storage Temperature Range                             | T <sub>J</sub> , T <sub>STG</sub> | -65 to +125 | °C   |

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

| Characteristic                     | Symbol             | Min | Typ. | Max   | Unit | Test Conditions                             |
|------------------------------------|--------------------|-----|------|-------|------|---|
| Reverse Breakdown Voltage (Note 7) | V <sub>(BR)R</sub> | 20  | —    | —     | V    | I <sub>R</sub> = 0.5mA                      |
| Forward Voltage Drop               | V <sub>F</sub>     | —   | —    | 0.310 | V    | I <sub>F</sub> = 0.1A                       |
|                                    |                    |     |      | 0.430 |      | I <sub>F</sub> = 0.5A                       |
| Leakage Current (Note 7)           | I <sub>R</sub>     | —   | —    | 100   | μA   | V <sub>R</sub> = 10V                        |
|                                    |                    |     |      | 250   |      | V <sub>R</sub> = 20V                        |
| Total Capacitance                  | C <sub>T</sub>     | —   | 120  | —     | pF   | f = 1MHz, V <sub>R</sub> = 0V <sub>DC</sub> |

- Notes:
5. Device mounted on FR-5 1.0 x 0.75 x 0.062 inch PCB pad layout.
  6. Device mounted on Alumina PCB, 0.4 inch x 0.3 inch x 0.024 inch pad layout.
  7. Short duration pulse test used to minimize self-heating effect.

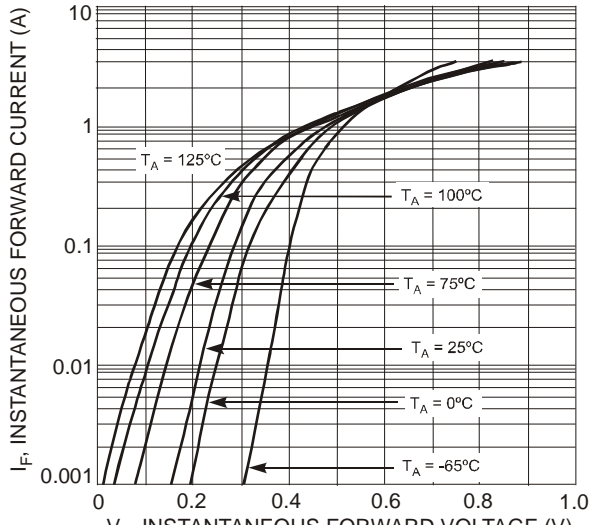


Fig. 1 Typical Forward Characteristics, Per Element

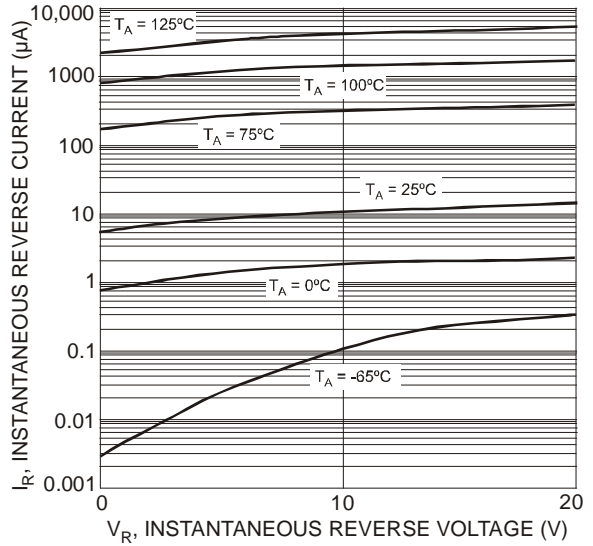


Fig. 2 Typical Reverse Characteristics, Per Element

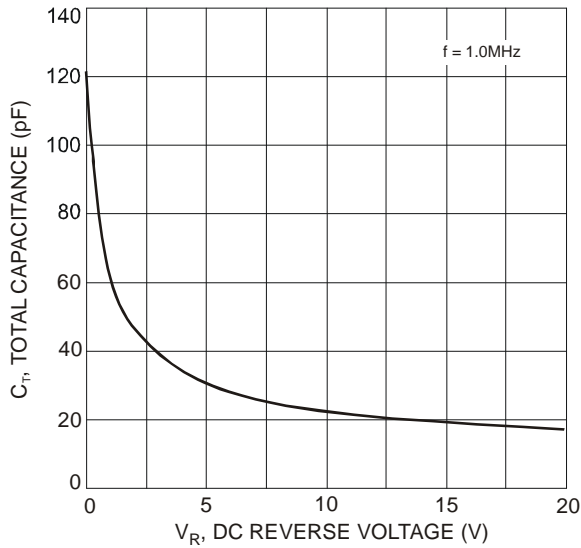


Fig. 3 Total Capacitance vs. Reverse Voltage, Per Element

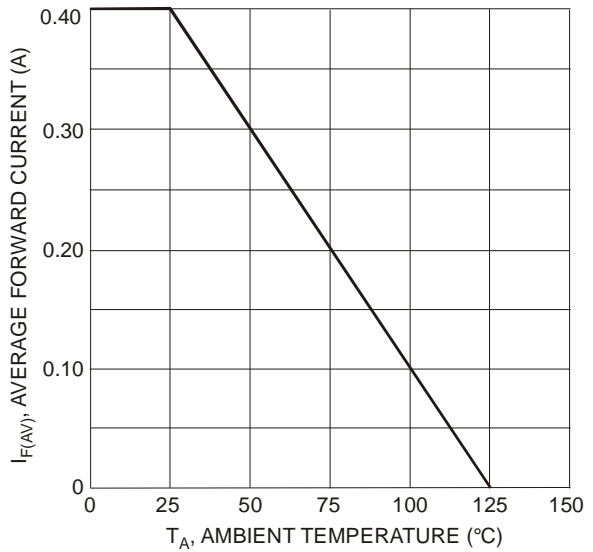
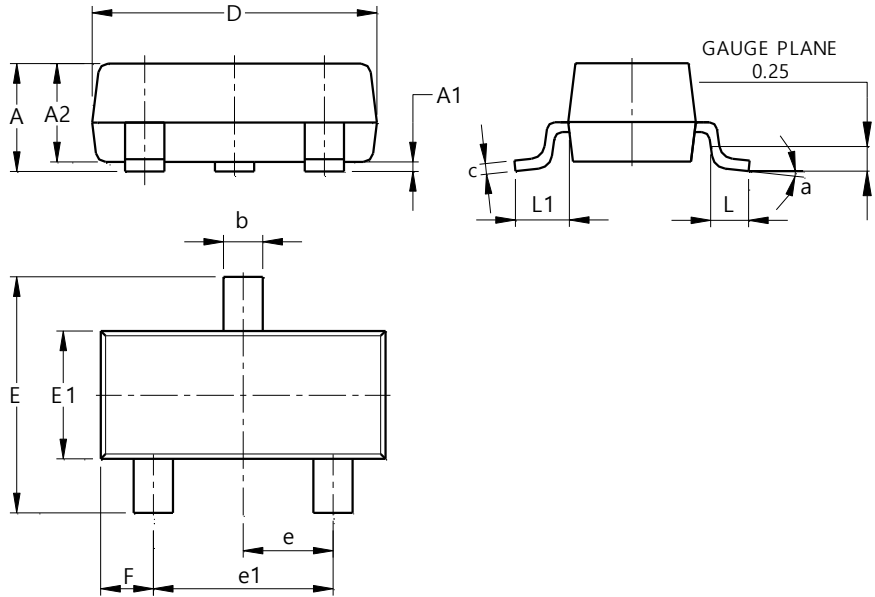


Fig. 4 Forward Current Derating Curve, Per Element

**Package Outline Dimensions**

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

**SOT23 (Standard)**

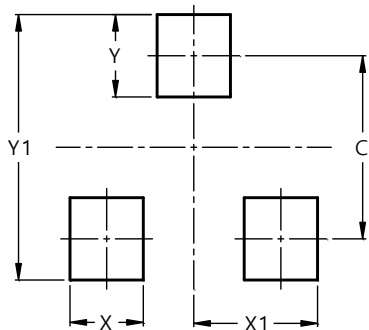


| SOT23 (Standard)     |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.90  | 1.15  | 1.025 |
| A1                   | 0.00  | 0.10  | 0.05  |
| A2                   | 0.85  | 1.10  | 0.975 |
| b                    | 0.30  | 0.51  | 0.40  |
| c                    | 0.080 | 0.202 | 0.11  |
| D                    | 2.80  | 3.00  | 2.90  |
| E                    | 2.25  | 2.55  | 2.40  |
| E1                   | 1.20  | 1.40  | 1.30  |
| e                    | 0.89  | 1.03  | 0.915 |
| e1                   | 1.78  | 2.05  | 1.83  |
| F                    | 0.40  | 0.60  | 0.535 |
| L1                   | 0.45  | 0.61  | 0.55  |
| L                    | 0.25  | 0.55  | 0.40  |
| a                    | 0°    | 8°    | --    |
| All Dimensions in mm |       |       |       |

**Suggested Pad Layout**

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

**SOT23 (Standard)**



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.0           |
| X          | 0.8           |
| X1         | 1.35          |
| Y          | 0.9           |
| Y1         | 2.9           |

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