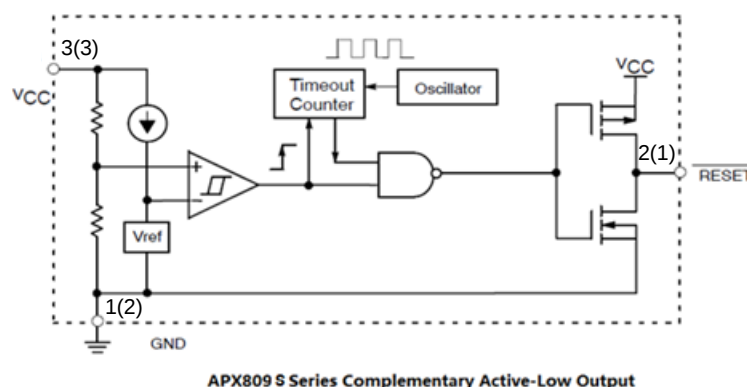


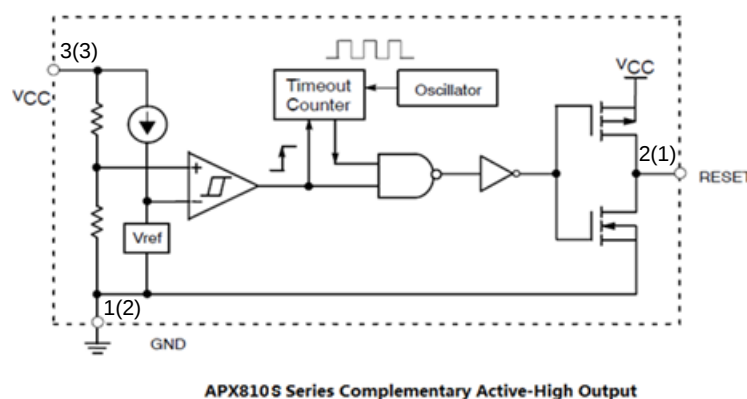
## Pin Descriptions

| Pin Number |            | Pin Name                  | Function                |
|------------|------------|---------------------------|-------------------------|
| SOT23 (SA) | SOT23 (SR) |                           |                         |
| 3          | 3          | VCC                       | Operating Voltage Input |
| 2          | 1          | RESET <sup>–</sup> /RESET | Reset Output Pin        |
| 1          | 2          | GND                       | Ground                  |

## Functional Block Diagram



A(B)  
A for SOT23 (SA)  
B for SOT23 (SR)



A(B)  
A for SOT23 (SA)  
B for SOT23 (SR)

# Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.) (Note 4)

| Symbol             | Parameter                              |       | Rating      | Unit |
|--------------------|----------------------------------------|-------|-------------|------|
| V <sub>CC</sub>    | Supply Voltage                         |       | -0.3 to 6.0 | V    |
| V <sub>RESET</sub> | RESET /RESET Voltage                   |       | -0.3 to 6.0 | V    |
| I <sub>CC</sub>    | Input Current                          |       | 20          | mA   |
| I <sub>O</sub>     | Output Current                         |       | 20          | mA   |
| θ <sub>JA</sub>    | Thermal Resistance Junction-to-Ambient | SOT23 | 232         | °C/W |
| θ <sub>JC</sub>    | Thermal Resistance Junction-to-Case    | SOT23 | 87          |      |
| ESD                | HBM (Human Body Model)                 |       | 6,000       | V    |
|                    | MM (Machine Model)                     |       | 600         |      |
| T <sub>J</sub>     | Junction Temperature Range             |       | -40 to +150 | °C   |
| T <sub>STG</sub>   | Storage Temperature Range              |       | -65 to +150 | °C   |

Note: 4. Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

# Recommended Operating Conditions (@T<sub>A</sub> = +25°C, unless otherwise specified.)

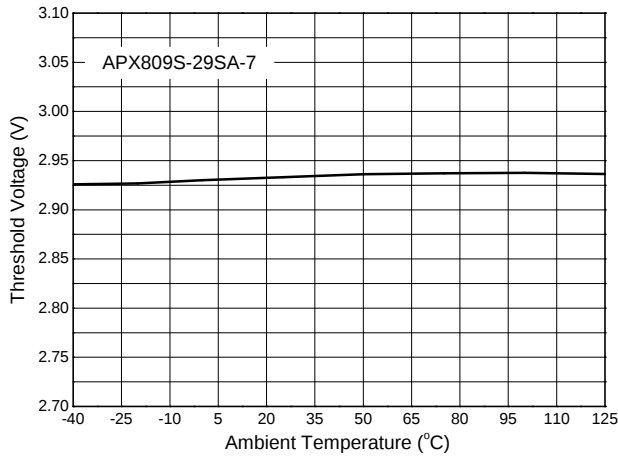
| Symbol             | Parameter                           | Min | Max  | Unit |
|--------------------|-------------------------------------|-----|------|------|
| T <sub>A</sub>     | Operating Ambient Temperature Range | -40 | +125 | °C   |
| V <sub>CC</sub>    | Supply Voltage                      | 1.0 | 5.5  | V    |
| V <sub>RESET</sub> | RESET /RESET Output Voltage         | 0   | 5.5  | V    |

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

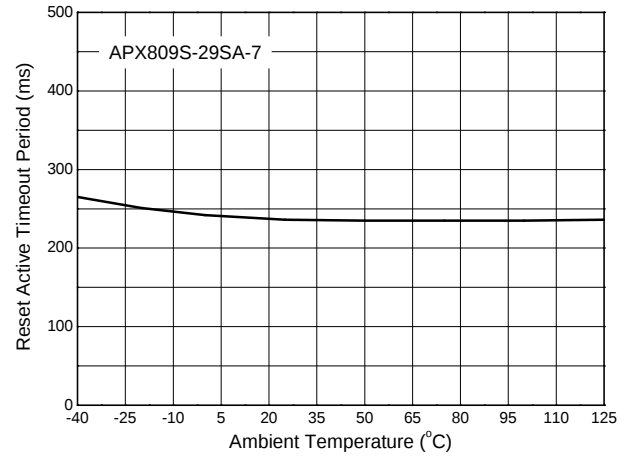
| Symbol                                         | Parameter                                               |                     | Test Conditions                                                             | Min                   | Typ  | Max  | Unit   |
|------------------------------------------------|---------------------------------------------------------|---------------------|-----------------------------------------------------------------------------|-----------------------|------|------|--------|
| I <sub>CC</sub>                                | Supply Current                                          |                     | V <sub>TH</sub> + 0.2V                                                      | —                     | 7    | 16   | μA     |
| V <sub>TH</sub>                                | APX809SXX/810SXX-23                                     |                     | T <sub>A</sub> = +25°C                                                      | 2.22                  | 2.25 | 2.29 | V      |
|                                                | APX809SXX/810SXX-26                                     |                     |                                                                             | 2.59                  | 2.63 | 2.67 |        |
|                                                | APX809SXX/810SXX-29                                     |                     |                                                                             | 2.89                  | 2.93 | 2.97 |        |
|                                                | APX809SXX/810SXX-31                                     |                     |                                                                             | 3.04                  | 3.08 | 3.12 |        |
|                                                | APX809SXX/810SXX-40                                     |                     |                                                                             | 3.94                  | 4.00 | 4.05 |        |
|                                                | APX809SXX/810SXX-44                                     |                     |                                                                             | 4.32                  | 4.38 | 4.44 |        |
|                                                | APX809SXX/810SXX-46                                     |                     |                                                                             | 4.57                  | 4.63 | 4.69 |        |
| $\frac{\Delta V_{TH}}{V_{TH} \times \Delta T}$ | Reset Threshold Voltage Temperature Coefficient         |                     | T <sub>A</sub> = -40 to +125°C                                              | —                     | 30   | —    | ppm/°C |
| t <sub>s</sub>                                 | V <sub>CC</sub> Drop to $\overline{\text{RESET}}$ Delay |                     | V <sub>CC</sub> = V <sub>TH</sub> to (V <sub>TH</sub> - 100mV)              | —                     | 20   | —    | μs     |
| t <sub>DELAY</sub>                             | Reset Active Timeout Period                             | APX809S00/810S00-XX | V <sub>CC</sub> ≥ 1.02 x V <sub>TH</sub>                                    | 1                     | 1.7  | 3.3  | ms     |
|                                                |                                                         | APX809S05/810S05-XX |                                                                             | 20                    | 50   | 70   |        |
|                                                |                                                         | APX809S/810S-XX     |                                                                             | 140                   | 240  | 280  |        |
| V <sub>OL</sub>                                | $\overline{\text{RESET}}$ Output Voltage Low (APX809S)  |                     | V <sub>CC</sub> = V <sub>TH</sub> - 0.2V, I <sub>SINK</sub> = 1.2mA         | —                     | —    | 0.3  | V      |
|                                                |                                                         |                     | V <sub>CC</sub> = V <sub>TH</sub> - 0.2V, I <sub>SINK</sub> = 3.2mA         | —                     | —    | 0.4  |        |
|                                                |                                                         |                     | V <sub>CC</sub> > 1.0V, I <sub>SINK</sub> = 50μA                            | —                     | —    | 0.3  |        |
| V <sub>OH</sub>                                | $\overline{\text{RESET}}$ Output Voltage-High (APX809S) |                     | V <sub>CC</sub> > V <sub>TH</sub> + 0.2V, I <sub>SOURCE</sub> = 500μA       | 0.8V <sub>CC</sub>    | —    | —    | V      |
|                                                |                                                         |                     | V <sub>CC</sub> > V <sub>TH</sub> + 0.2V, I <sub>SOURCE</sub> = 800μA       | V <sub>CC</sub> - 1.5 | —    | —    |        |
| V <sub>OL</sub>                                | RESET Output Voltage-Low (APX810S)                      |                     | V <sub>CC</sub> = V <sub>TH</sub> + 0.2V, I <sub>SINK</sub> = 1.2mA         | —                     | —    | 0.3  | V      |
|                                                |                                                         |                     | V <sub>CC</sub> = V <sub>TH</sub> + 0.2V, I <sub>SINK</sub> = 3.2mA         | —                     | —    | 0.4  |        |
| V <sub>OH</sub>                                | RESET Output Voltage-High (APX810S)                     |                     | 1.8V < V <sub>CC</sub> < V <sub>TH</sub> - 0.2, I <sub>SOURCE</sub> = 150μA | 0.8V <sub>CC</sub>    | —    | —    | V      |

## Performance Characteristics

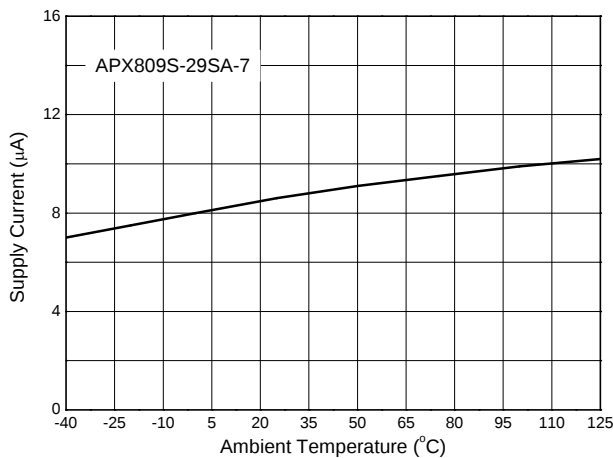
**RESET Threshold Voltage vs. Temperature**



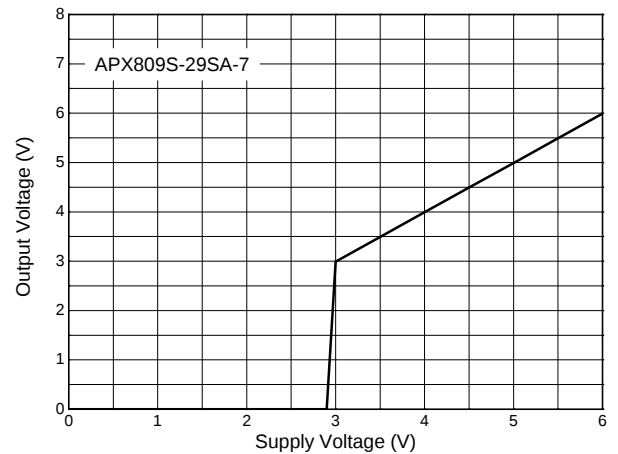
**RESET Active Timeout Period vs. Temperature**



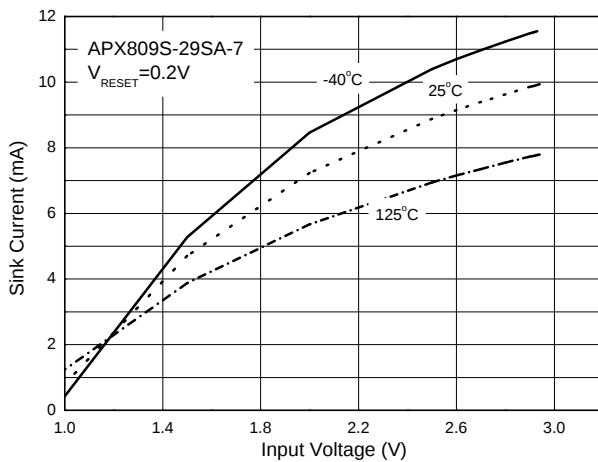
**Supply Current vs. Temperature**



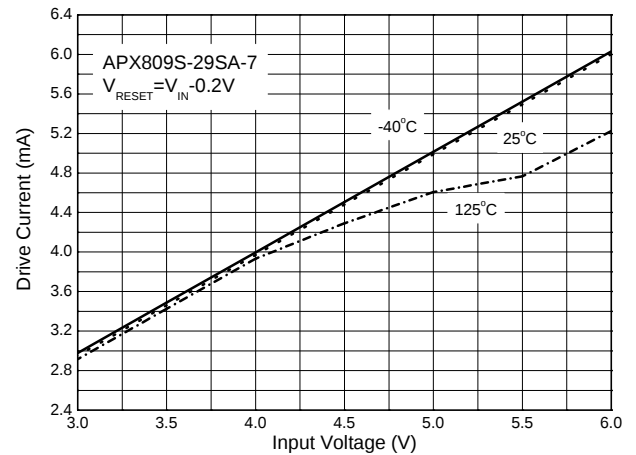
**Output Voltage vs. Input Voltage**



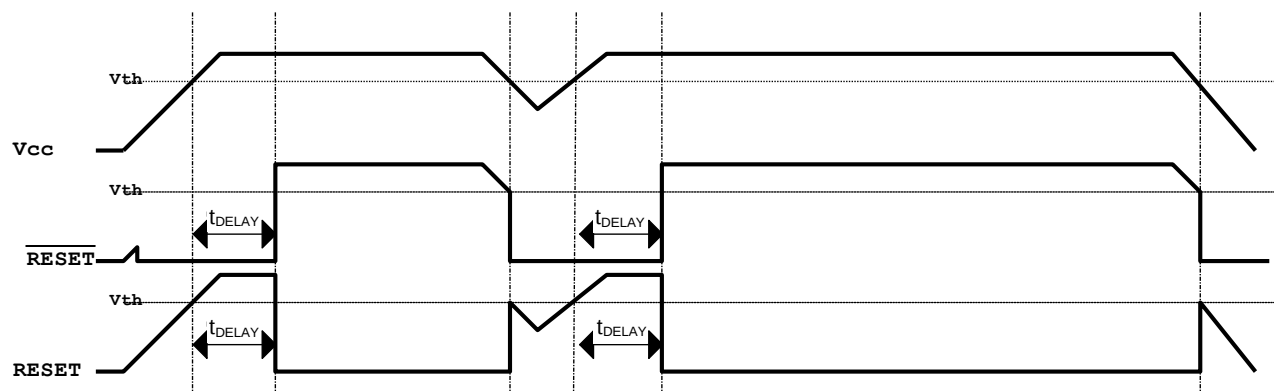
**Output Sink Current vs. Input Voltage**



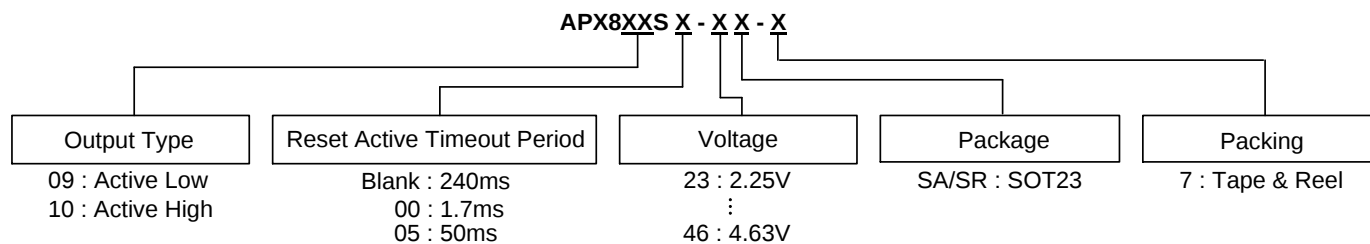
**Output Sink Current vs. Input Voltage**



## Timing Diagram



## Ordering Information

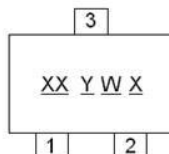


| Part Number      | Package Code | Packaging | 7" Tape and Reel  |                    |
|------------------|--------------|-----------|-------------------|--------------------|
|                  |              |           | Quantity          | Part Number Suffix |
| APX809SXX-XXSA-7 | SA           | SOT23     | 3,000/Tape & Reel | -7                 |
| APX810SXX-XXSA-7 | SA           | SOT23     | 3,000/Tape & Reel | -7                 |
| APX809SXX-XXSR-7 | SR           | SOT23     | 3,000/Tape & Reel | -7                 |
| APX810SXX-XXSR-7 | SR           | SOT23     | 3,000/Tape & Reel | -7                 |

## Marking Information

### 1) SOT23

( Top View )



XX : Identification code  
 Y : Year 0~9  
 W : Week : A~Z : 1~26 week;  
       a~z : 27~52 week; z represents  
       52 and 53 week  
 X : A~Z : Green

| Part Number      | Package | Identification Code |
|------------------|---------|---------------------|
| APX809S00-46SA-7 | SOT23   | PB                  |
| APX809S05-46SA-7 | SOT23   | R5                  |
| APX809S-46SA-7   | SOT23   | X2                  |
| APX809S00-44SA-7 | SOT23   | PC                  |
| APX809S05-44SA-7 | SOT23   | R6                  |
| APX809S-44SA-7   | SOT23   | X3                  |
| APX809S00-40SA-7 | SOT23   | PD                  |
| APX809S05-40SA-7 | SOT23   | R7                  |
| APX809S-40SA-7   | SOT23   | X4                  |
| APX809S00-31SA-7 | SOT23   | PE                  |
| APX809S05-31SA-7 | SOT23   | R8                  |
| APX809S-31SA-7   | SOT23   | X5                  |
| APX809S00-29SA-7 | SOT23   | Q2                  |
| APX809S05-29SA-7 | SOT23   | RM                  |
| APX809S-29SA-7   | SOT23   | X6                  |
| APX809S00-26SA-7 | SOT23   | Q3                  |
| APX809S05-26SA-7 | SOT23   | RN                  |
| APX809S-26SA-7   | SOT23   | X7                  |
| APX809S00-23SA-7 | SOT23   | Q4                  |
| APX809S05-23SA-7 | SOT23   | RP                  |
| APX809S-23SA-7   | SOT23   | X8                  |
| APX810S00-46SA-7 | SOT23   | Q5                  |
| APX810S05-46SA-7 | SOT23   | RR                  |
| APX810S-46SA-7   | SOT23   | XA                  |
| APX810S00-44SA-7 | SOT23   | Q6                  |
| APX810S05-44SA-7 | SOT23   | RS                  |
| APX810S-44SA-7   | SOT23   | XB                  |
| APX810S00-40SA-7 | SOT23   | Q7                  |
| APX810S05-40SA-7 | SOT23   | RT                  |
| APX810S-40SA-7   | SOT23   | XC                  |
| APX810S00-31SA-7 | SOT23   | Q8                  |
| APX810S05-31SA-7 | SOT23   | RU                  |
| APX810S-31SA-7   | SOT23   | XD                  |
| APX810S00-29SA-7 | SOT23   | Q9                  |
| APX810S05-29SA-7 | SOT23   | RV                  |
| APX810S-29SA-7   | SOT23   | XE                  |
| APX810S00-26SA-7 | SOT23   | QJ                  |
| APX810S05-26SA-7 | SOT23   | RW                  |
| APX810S-26SA-7   | SOT23   | XF                  |
| APX810S00-23SA-7 | SOT23   | QK                  |
| APX810S05-23SA-7 | SOT23   | RX                  |
| APX810S-23SA-7   | SOT23   | XG                  |

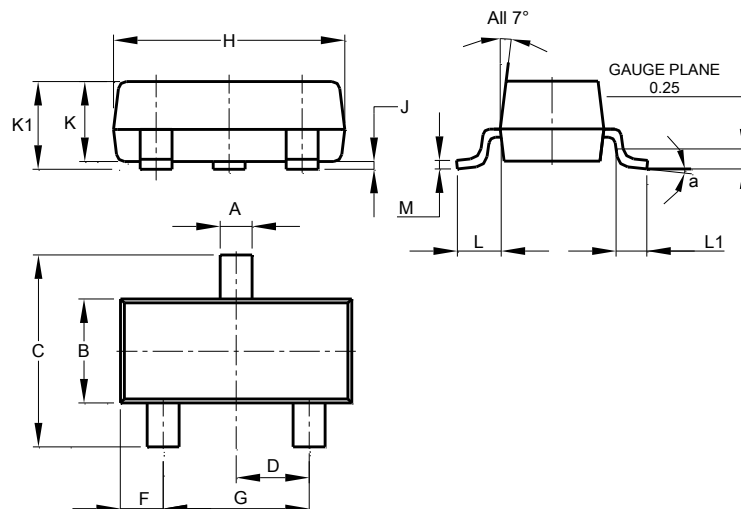
## Marking Information (Cont.)

| Part Number      | Package | Identification Code |
|------------------|---------|---------------------|
| APX809S00-46SR-7 | SOT23   | QM                  |
| APX809S05-46SR-7 | SOT23   | RY                  |
| APX809S-46SR-7   | SOT23   | Y2                  |
| APX809S00-44SR-7 | SOT23   | QN                  |
| APX809S05-44SR-7 | SOT23   | RZ                  |
| APX809S-44SR-7   | SOT23   | Y3                  |
| APX809S00-40SR-7 | SOT23   | QP                  |
| APX809S05-40SR-7 | SOT23   | SM                  |
| APX809S-40SR-7   | SOT23   | Y4                  |
| APX809S00-31SR-7 | SOT23   | QQ                  |
| APX809S05-31SR-7 | SOT23   | SP                  |
| APX809S-31SR-7   | SOT23   | Y5                  |
| APX809S00-29SR-7 | SOT23   | QR                  |
| APX809S05-29SR-7 | SOT23   | SR                  |
| APX809S-29SR-7   | SOT23   | Y6                  |
| APX809S00-26SR-7 | SOT23   | QS                  |
| APX809S05-26SR-7 | SOT23   | SS                  |
| APX809S-26SR-7   | SOT23   | Y7                  |
| APX809S00-23SR-7 | SOT23   | QT                  |
| APX809S05-23SR-7 | SOT23   | ST                  |
| APX809S-23SR-7   | SOT23   | Y8                  |
| APX810S00-46SR-7 | SOT23   | QU                  |
| APX810S05-46SR-7 | SOT23   | SU                  |
| APX810S-46SR-7   | SOT23   | YA                  |
| APX810S00-44SR-7 | SOT23   | QV                  |
| APX810S05-44SR-7 | SOT23   | SV                  |
| APX810S-44SR-7   | SOT23   | YB                  |
| APX810S00-40SR-7 | SOT23   | QW                  |
| APX810S05-40SR-7 | SOT23   | SW                  |
| APX810S-40SR-7   | SOT23   | YC                  |
| APX810S00-31SR-7 | SOT23   | QX                  |
| APX810S05-31SR-7 | SOT23   | SX                  |
| APX810S-31SR-7   | SOT23   | YD                  |
| APX810S00-29SR-7 | SOT23   | QY                  |
| APX810S05-29SR-7 | SOT23   | SY                  |
| APX810S-29SR-7   | SOT23   | YE                  |
| APX810S00-26SR-7 | SOT23   | QZ                  |
| APX810S05-26SR-7 | SOT23   | SZ                  |
| APX810S-26SR-7   | SOT23   | YF                  |
| APX810S00-23SR-7 | SOT23   | R4                  |
| APX810S05-23SR-7 | SOT23   | TY                  |
| APX810S-23SR-7   | SOT23   | YG                  |

## Package Outline Dimensions

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

SOT23

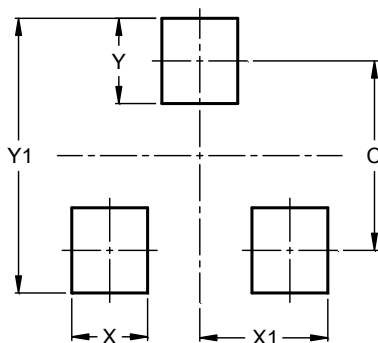


| SOT23                |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | 0.37  | 0.51  | 0.40  |
| B                    | 1.20  | 1.40  | 1.30  |
| C                    | 2.30  | 2.50  | 2.40  |
| D                    | 0.89  | 1.03  | 0.915 |
| F                    | 0.45  | 0.60  | 0.535 |
| G                    | 1.78  | 2.05  | 1.83  |
| H                    | 2.80  | 3.00  | 2.90  |
| J                    | 0.013 | 0.10  | 0.05  |
| K                    | 0.890 | 1.00  | 0.975 |
| K1                   | 0.903 | 1.10  | 1.025 |
| L                    | 0.45  | 0.61  | 0.55  |
| L1                   | 0.25  | 0.55  | 0.40  |
| M                    | 0.085 | 0.150 | 0.110 |
| a                    | 0°    | 8°    | --    |
| All Dimensions in mm |       |       |       |

## Suggested Pad Layout

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

SOT23



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

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