

## Features

- Low power consumption
- Low voltage drop
- Low temperature coefficient
- Low Quiescent Current: 40μA
- Output voltage accuracy: tolerance  $\pm 2\%$

## Applications

- Battery-powered equipment
- Reference voltage sources
- Cameras, video cameras
- Portable AV systems
- Mobile phones
- Portable games

## General Description

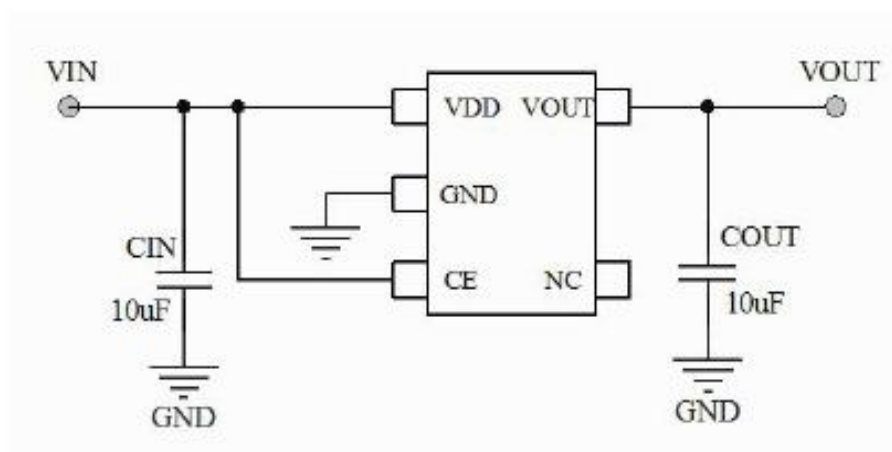
MLS6219 series are a highly precise, lower consumption, 3 terminal, positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage.

The MLS6219 consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error correction circuit. The series is compatible with low ESR ceramic capacitors. The current limiter's foldback circuit operates as a short circuit protection as well as the output current limiter for the output pin. Output voltages are internally by laser trimming technologies. It is selectable in 0.1V increments within a range of 1.2V to 5.0V. MLS6219 series are available in SOT-23-5L and SOT-89 packages.

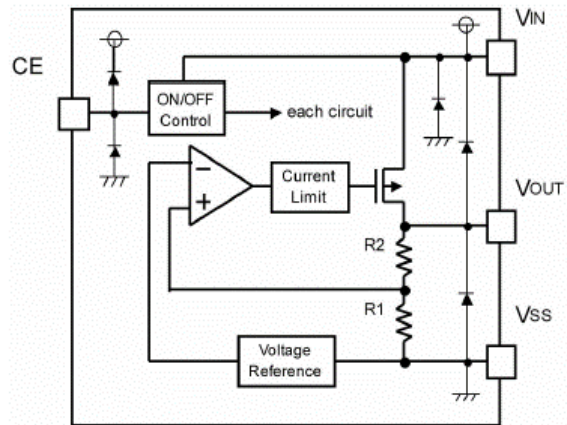


Halogen-Free

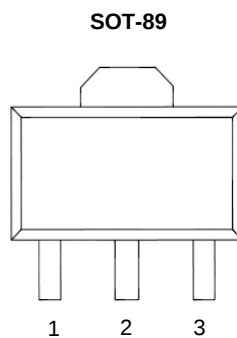
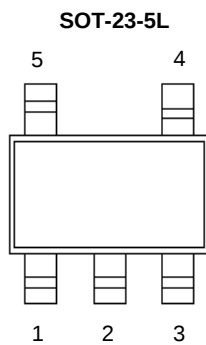
## Typical Application



## Block Diagram



## Packages And Pin Assignment



| Pin No.   |        | Name | Description                                                                                                                                                                                             |
|-----------|--------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOT-23-5L | SOT-89 |      |                                                                                                                                                                                                         |
| 2         | 1      | GND  | Ground pin                                                                                                                                                                                              |
| 5         | 3      | VOUT | Regulator Output pin.                                                                                                                                                                                   |
| 1         | 2      | VIN  | Power Supply Voltage input.                                                                                                                                                                             |
| 3         | -      | EN   | Enable Input Logic, Active High. When the EN goes to a logic low, the device will be shutdown mode. This pin cannot be left floating to enable the device. The maximum voltage must remain below 6.5 V. |
| 4         | -      | NC   | No Internal Connection.                                                                                                                                                                                 |

## Marking Rule

| VOLTAGE(V) | MARKING |
|------------|---------|
| 1.2        |         |
| 1.5        | 4XEK    |
| 1.8        | 4XKK    |
| 2.5        | 4XTK    |
| 2.8        | 4XXK    |
| 3.0        | 4XZK    |
| 3.3        | 4B2K    |

## Absolute Maximum Ratings

$$*I_{OUT} = P_d / (V_{IN} - V_{OUT})$$

| Parameter                   |           | Symbol    | Ratings                      | Units |
|-----------------------------|-----------|-----------|------------------------------|-------|
| Input Voltage               |           | $V_{IN}$  | $V_{SS}-0.3 \sim V_{IN}+8$   | V     |
| Output Current              |           | $I_{OUT}$ | 350                          | mA    |
| Output Voltage              |           | $V_{OUT}$ | $V_{SS}-0.3 \sim V_{IN}+0.3$ | V     |
| Power Dissipation           | SOT-23-5L | $P_d$     | 400                          | mW    |
|                             | SOT-89    |           | 600                          | mW    |
| Operating Temperature Range |           | $T_{opr}$ | -40~+85                      | °C    |
| Storage Temperature Range   |           | $T_{stg}$ | -55~+125                     | °C    |

## Electrical Characteristics

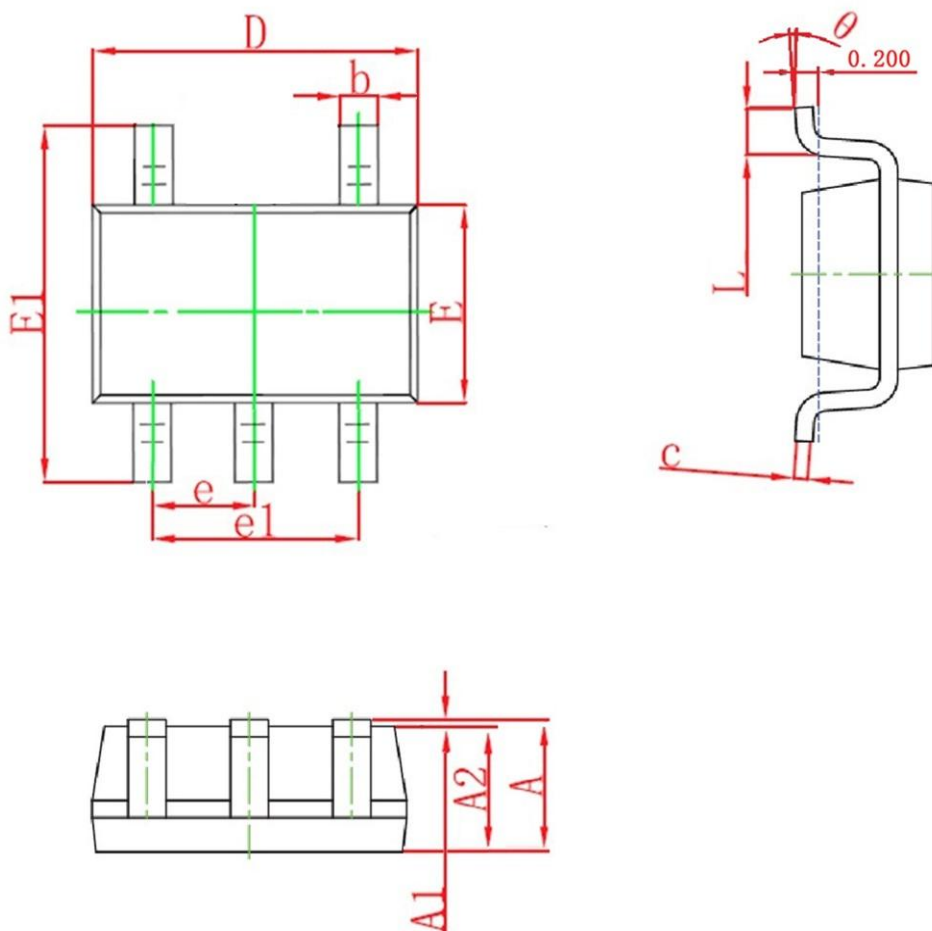
MLS6219 for any output voltage

 $T_a = 25^{\circ}\text{C}$ 

| Symbol                                                 | Parameter                               | Conditions                                                                      | Min.                  | Typ. | Max.                  | Unit   |
|--------------------------------------------------------|-----------------------------------------|---------------------------------------------------------------------------------|-----------------------|------|-----------------------|--------|
| $V_{OUT}$                                              | Output Voltage                          | $V_{in} = V_{out} + 1V$<br>$1.0\text{mA} \leq I_{out} \leq 30\text{mA}$         | $V_{out} \times 0.98$ | -    | $V_{out} \times 1.02$ | V      |
| $I_{OUT}$                                              | Output Current*1                        | $V_{in} - V_{out} = 1V$                                                         | -                     | 350  | -                     | mA     |
| $V_{drop}$                                             | Dropout Voltage                         | $I_{OUT} = 100\text{mA}$                                                        | -                     | 120  | -                     | mV     |
| $\frac{\Delta V_{OUT1}}{\Delta V_{IN} \times V_{OUT}}$ | Line Regulation                         | $4.3V \leq V_{in} \leq 8V$<br>$I_{out} = 10\text{mA}$                           | -                     | 0.05 | 0.2                   | %/V    |
| $\frac{\Delta V_{OUT}}{I_{OUT}}$                       | Load Regulation                         | $V_{in} = 4.3V$<br>$1.0\text{mA} \leq I_{out} \leq 100\text{mA}$                | -                     | 10   | 30                    | mV     |
| $\frac{\Delta V_{OUT}}{T_a \times V_{OUT}}$            | Output voltage Temperature Coefficiency | $I_{out} = 30\text{mA}$<br>$0^{\circ}\text{C} \leq T_a \leq 70^{\circ}\text{C}$ | -                     | 100  | -                     | Ppm/°C |
| $I_{SS}$                                               | Supply Current                          | -                                                                               | -                     | 40   | -                     | μA     |
| $V_{IN}$                                               | Input Voltage                           | -                                                                               | -                     | -    | 8.0                   | V      |
| PSRR                                                   | PSRR                                    | $F = 1\text{KHz}$<br>$V_{in} = 4.3V_{dc} + 1V_{pp}$                             | -                     | 60   | -                     | dB     |
| $V_{ENH}$                                              | EN high level                           | -                                                                               | 1.0                   | -    | -                     | V      |
| $V_{ENL}$                                              | EN low level                            | -                                                                               | -                     | -    | 0.4                   | V      |

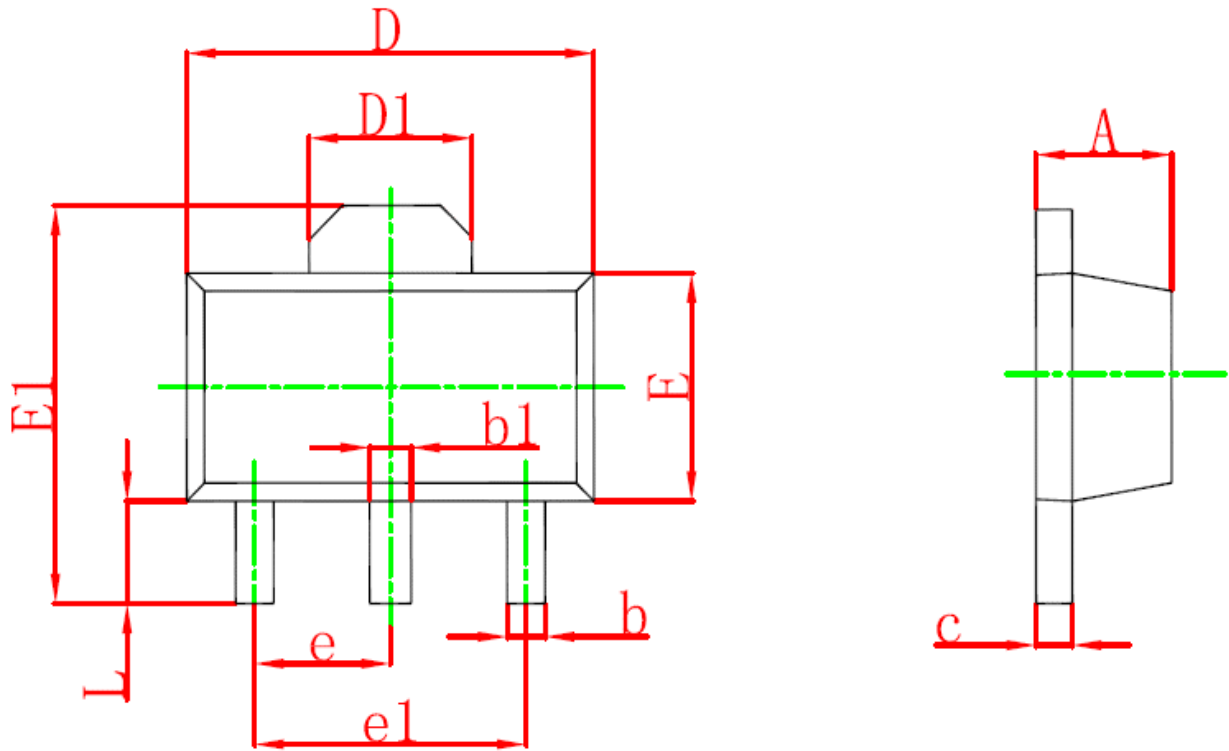
## Package Information

SOT-89



| Symbol | Dimensions in Millimeters(mm) |       | Dimensions In Inches |       |
|--------|-------------------------------|-------|----------------------|-------|
|        | Min                           | Max   | Min                  | Max   |
| A      | 1.050                         | 1.250 | 0.041                | 0.049 |
| A1     | 0.000                         | 0.100 | 0.000                | 0.004 |
| A2     | 1.050                         | 1.150 | 0.041                | 0.045 |
| b      | 0.300                         | 0.500 | 0.012                | 0.020 |
| c      | 0.100                         | 0.200 | 0.004                | 0.008 |
| D      | 2.820                         | 3.020 | 0.111                | 0.119 |
| E      | 1.500                         | 1.700 | 0.059                | 0.067 |
| E1     | 2.650                         | 2.950 | 0.104                | 0.116 |
| e      | 0.950TYP                      |       | 0.037TYP             |       |
| e1     | 1.800                         | 2.000 | 0.071                | 0.079 |
| L      | 0.300                         | 0.600 | 0.012                | 0.024 |
| θ      | 0°                            | 8°    | 0°                   | 8°    |

SOT-89



| Symbol | Dimensions in Millimeters(mm) |       | Dimensions in Inches |       |
|--------|-------------------------------|-------|----------------------|-------|
|        | Min                           | Max   | Min                  | Max   |
| A      | 1.400                         | 1.600 | 0.055                | 0.063 |
| b      | 0.320                         | 0.520 | 0.013                | 0.020 |
| b1     | 0.400                         | 0.580 | 0.016                | 0.023 |
| c      | 0.350                         | 0.440 | 0.014                | 0.017 |
| D      | 4.400                         | 4.600 | 0.173                | 0.181 |
| D1     | 1.550 REF                     |       | 0.061 REF            |       |
| E      | 2.300                         | 2.600 | 0.091                | 0.102 |
| E1     | 3.940                         | 4.250 | 0.155                | 0.167 |
| e      | 1.500 TYP                     |       | 0.060 TYP            |       |
| e1     | 3.000 TYP                     |       | 0.118 TYP            |       |
| L      | 0.900                         | 1.200 | 0.035                | 0.047 |