

300mA Low Dropout Linear Regulator

■ FEATURES

- Low dropout voltage of 130mV at 100mA output current (5.2V output version).
- Guaranteed 300mA output current.
- Internal 1.3Ω P-MOSFET draws no base current.
- Low ground current: 55uA.
- Accuracy of output voltage 2% of 3.3V/ 3.4V/ 3.5V/ 3.6V/ 3.7V/ 3.8V/ 5.0V/ 5.2V.
- Input voltage range up to 12V.
- Needs only 1μF for stability.
- Current limiting and thermal Protection.

■ APPLICATIONS

- Voltage Regulator for CD-ROM Drivers.
- Voltage Regulator for LAN Cards.
- Voltage Regulator for Microprocessor.
- Wireless Communication Systems.
- Battery Powered Systems.

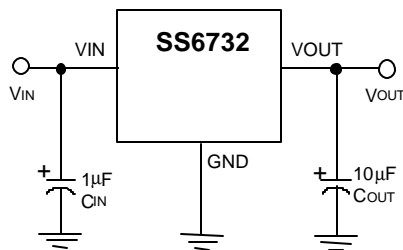
■ DESCRIPTION

The SS6732 is a 3-pin low-dropout linear regulator. The superior characteristics of the SS6732 include zero base current loss, very low dropout voltage, and 2% accurate output voltage. Typical ground current remains approximately 55μA, under output conditions from zero up to the maximum load. Dropout voltage at 100mA output current is exceptionally low: 130mV for the SS6732-50 and -52, 180mV for the SS6732-33, -34, SS6732-35, -36, -37 and -38.

Current limiting and thermal protection are built in to protect the SS6732 against fault conditions.

The SS6732 comes in the popular 3-pin SOT-89 package.

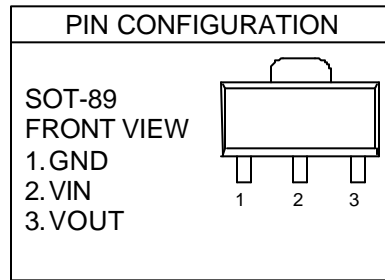
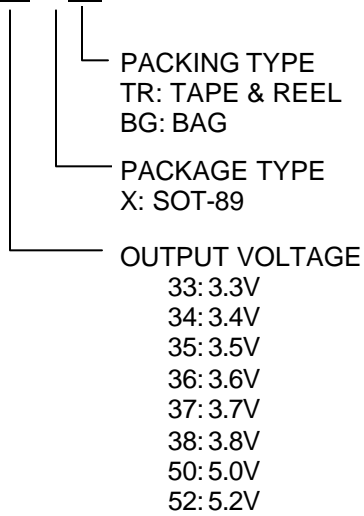
■ TYPICAL APPLICATION CIRCUIT



Low Dropout Linear Regulator

ORDERING INFORMATION

SS6732-XXCXXX



Example: SS6732-33CXTR
 → 3.3V Version, in SOT-89 Package
 in Tape & Reel Packing

ABSOLUTE MAXIMUM RATINGS

| | |
|--|---------------------------|
| Input Supply Voltage..... | -0.3~12V |
| Operating Junction Temperature Range | -40°C~ 125°C |
| Storage Temperature Range | -65°C~150°C |
| Power Dissipation | SOT-89 Package 0.5W |

TEST CIRCUIT

Refer to the TYPICAL APPLICATION CIRCUIT

■ **ELECTRICAL CHARACTERISTICS** ($T_J=25^\circ\text{C}$, $C_{IN}=1\text{mF}$, $C_{OUT}=10\text{mF}$, unless otherwise specified.)

| PARAMETER | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---------------------------------------|---|-------|------|-------|-----------------------|
| Output Voltage | SS6732-52 $V_{IN}=5.5\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 5.100 | 5.2 | 5.300 | V |
| | SS6732-50 $V_{IN}=5.5\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 4.900 | 5.0 | 5.100 | |
| | SS6732-38 $V_{IN}=4.1\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 3.725 | 3.8 | 3.875 | |
| | SS6732-37 $V_{IN}=4.0\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 3.625 | 3.7 | 3.775 | |
| | SS6732-36 $V_{IN}=4.0\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 3.528 | 3.6 | 3.672 | |
| | SS6732-35 $V_{IN}=4.0\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 3.430 | 3.5 | 3.570 | |
| | SS6732-34 $V_{IN}=4.0\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 3.332 | 3.4 | 3.468 | |
| | SS6732-33 $V_{IN}=3.6\sim 12\text{V}$, $I_{OUT}=0\text{mA}$ | 3.235 | 3.3 | 3.365 | |
| Output Voltage Temp. Coefficiency | (Note 1) | | 50 | 150 | PPM/ $^\circ\text{C}$ |
| Line Regulation | $I_{OUT}=1\text{mA}$ | | | | mV |
| | SS6732-52 $V_{IN}=5.5\sim 12\text{V}$ | | 5 | 15 | |
| | SS6732-50 $V_{IN}=5.5\sim 12\text{V}$ | | 5 | 15 | |
| | SS6732-38 $V_{IN}=4.1\sim 12\text{V}$ | | 5 | 15 | |
| | SS6732-37 $V_{IN}=4.0\sim 12\text{V}$ | | 5 | 15 | |
| | SS6732-36 $V_{IN}=4.0\sim 12\text{V}$ | | 5 | 15 | |
| | SS6732-35 $V_{IN}=4.0\sim 12\text{V}$ | | 5 | 15 | |
| | SS6732-34 $V_{IN}=4.0\sim 12\text{V}$ | | 5 | 15 | |
| SS6732-33 $V_{IN}=3.6\sim 12\text{V}$ | | 5 | 15 | | |
| Load Regulation (Note 2) | SS6732-52 $V_{IN}=7\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | mV |
| | SS6732-50 $V_{IN}=7\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | |
| | SS6732-38 $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | |
| | SS6732-37 $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | |
| | SS6732-36 $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | |
| | SS6732-35 $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | |
| | SS6732-34 $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | |
| | SS6732-33 $V_{IN}=5\text{V}$, $I_{OUT}=0.1\sim 300\text{mA}$ | | 15 | 40 | |
| Current Limit (Note 3) | SS6732-52 $V_{IN}=7\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | mA |
| | SS6732-50 $V_{IN}=7\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | |
| | SS6732-38 $V_{IN}=7\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | |
| | SS6732-37 $V_{IN}=5\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | |
| | SS6732-36 $V_{IN}=5\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | |
| | SS6732-35 $V_{IN}=5\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | |
| | SS6732-34 $V_{IN}=5\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | |
| | SS6732-33 $V_{IN}=5\text{V}$, $V_{OUT}=0\text{V}$ | 300 | 440 | | |

■ ELECTRICAL CHARACTERISTICS (Continued)

| PARAMETER | TEST CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|-------------------------------|---------------------------------|------|------|------|---------|
| Dropout Voltage (Note 4) | SS6732-52 $I_{OUT}=300mA$ | | 400 | 500 | mV |
| | SS6732-50 $I_{OUT}=300mA$ | | 400 | 500 | |
| | SS6732-38 $I_{OUT}=300mA$ | | 540 | 640 | |
| | SS6732-37 $I_{OUT}=300mA$ | | 540 | 640 | |
| | SS6732-36 $I_{OUT}=300mA$ | | 540 | 640 | |
| | SS6732-35 $I_{OUT}=300mA$ | | 540 | 640 | |
| | SS6732-34 $I_{OUT}=300mA$ | | 540 | 640 | |
| | SS6732-33 $I_{OUT}=300mA$ | | 540 | 640 | |
| Ground Current | $I_{OUT}=0.1mA \sim I_{MAX}$ | | | | μA |
| | SS6732-52 $V_{IN}=5.5 \sim 12V$ | | 55 | 80 | |
| | SS6732-50 $V_{IN}=5.5 \sim 12V$ | | 55 | 80 | |
| | SS6732-38 $V_{IN}=4 \sim 12V$ | | 55 | 80 | |
| | SS6732-37 $V_{IN}=4 \sim 12V$ | | 55 | 80 | |
| | SS6732-36 $V_{IN}=4 \sim 12V$ | | 55 | 80 | |
| | SS6732-35 $V_{IN}=4 \sim 12V$ | | 55 | 80 | |
| | SS6732-34 $V_{IN}=4 \sim 12V$ | | 55 | 80 | |
| SS6732-33 $V_{IN}=4 \sim 12V$ | | 55 | 80 | | |

Note 1: Guaranteed by design.

Note 2: Regulation is measured at constant junction temperature, using pulse testing with a low ON time.

Note 3: Current limit is measured by pulsing a short time.

Note 4: Dropout voltage is defined as the input to output differential at which the output voltage drops 100mV below the value measured with a 1V differential.

■ TYPICAL PERFORMANCE CHARACTERISTICS

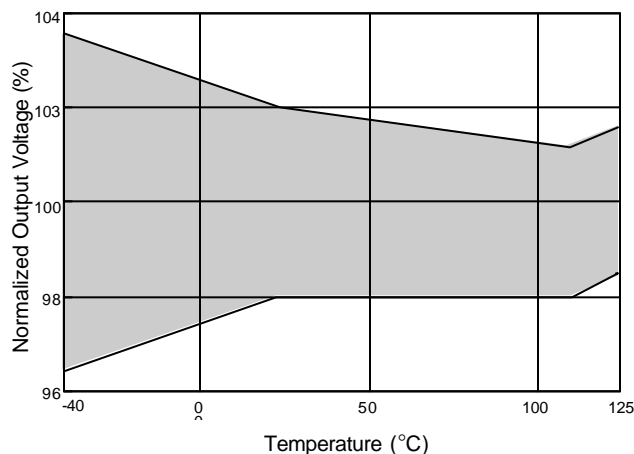


Fig. 1 Output Voltage vs. Temperature

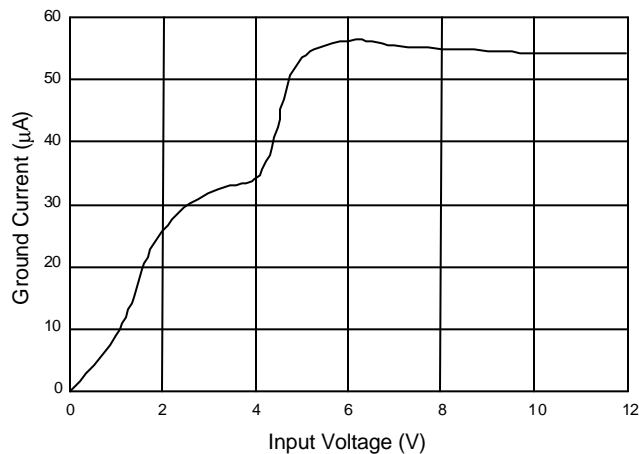


Fig. 2 Ground Current vs. Input Voltage

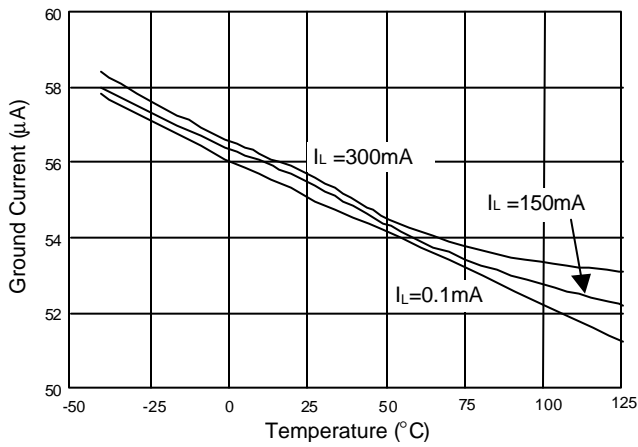
TYPICAL PERFORMANCE CHARACTERISTICS (Continued)


Fig. 3 Ground Current vs. Temperature

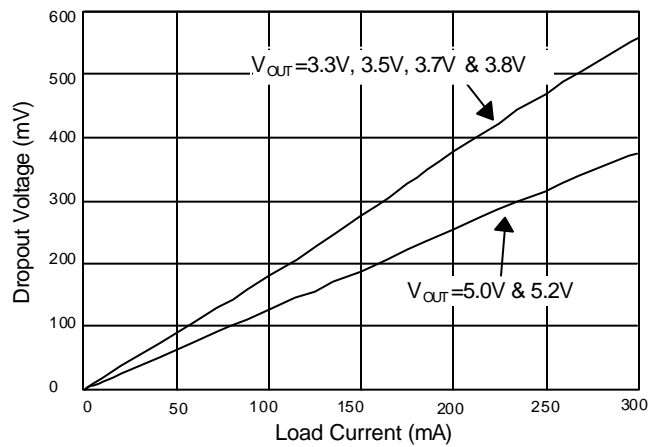


Fig. 4 Dropout Voltage vs. Load Current

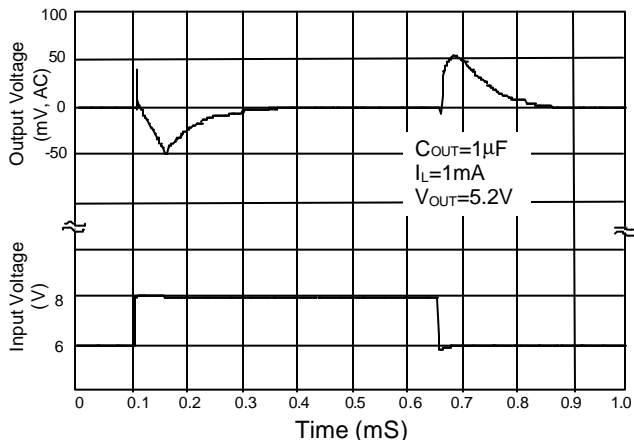


Fig. 5 Line Transient Response

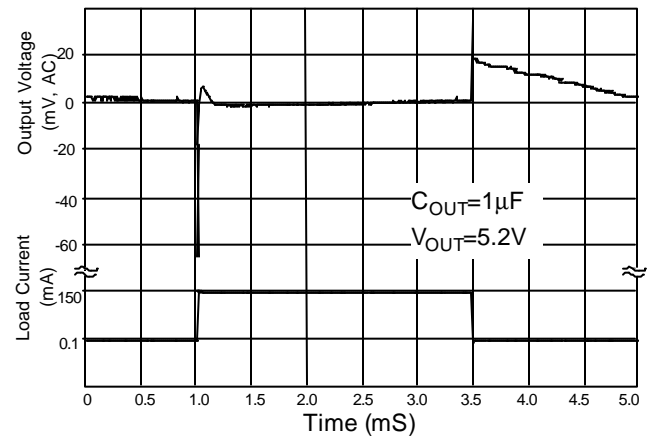


Fig. 6 Load transient Response

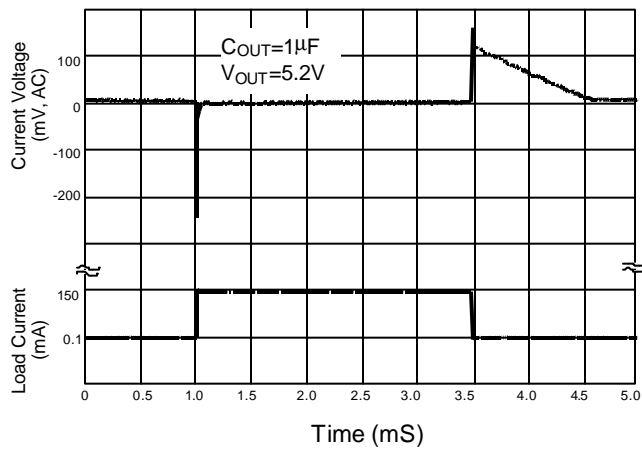


Fig. 7 Load Transient Response

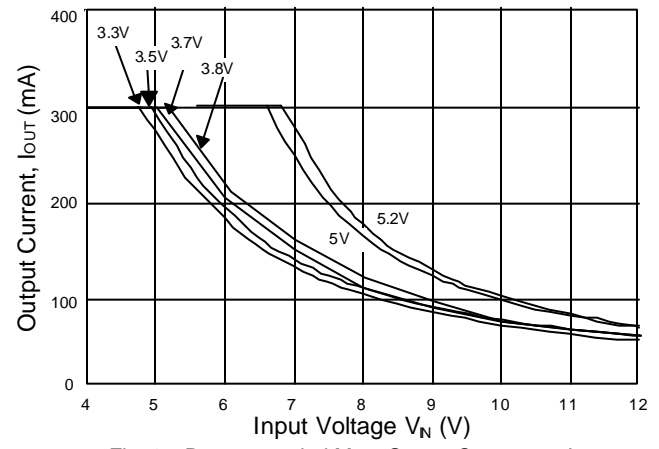
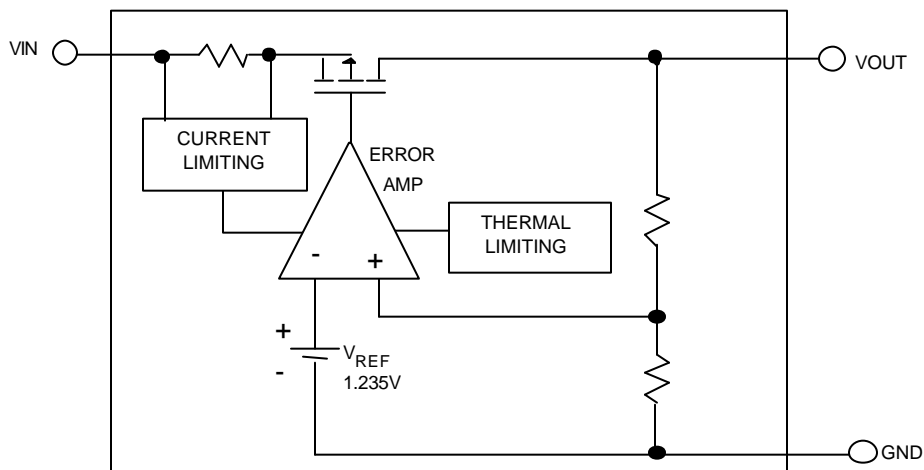


Fig. 8 Recommended Max. Output Current vs. Input Voltage

■ BLOCK DIAGRAM



■ PIN DESCRIPTIONS

VOUT PIN - Output pin.

GND PIN - Power GND.

VIN PIN - Power Supply Input.

■ APPLICATION INFORMATIONS

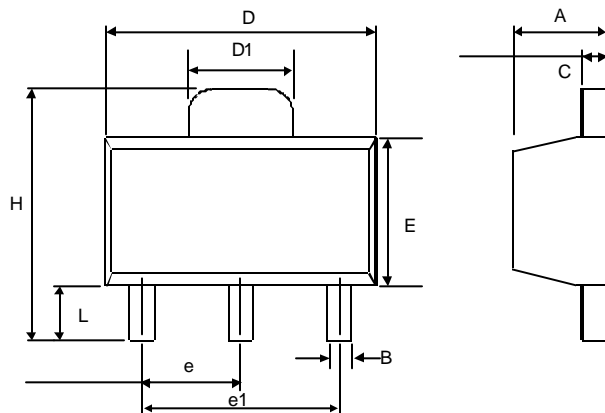
A capacitor of at least 1 μ F is required between the device output pin and ground for stability. Without this capacitor the part will oscillate. Even though most types of capacitor may work, the equivalent series resistance (ESR) should be held to 5 Ω or less if an Aluminum electrolytic type is used. Many Aluminum electrolytics have electrolytes that freeze at about -30°C, so solid tantalums are recommended for operation below -25°C. The

value of this capacitor may be increased without limit.

A capacitor of at least 0.1 μ F should be placed from the SS6732 input to ground if the lead inductance between the input and power source exceeds 500nH (approximately 10 inches of trace).

■ PHYSICAL DIMENSIONS

● SOT-89 (unit: mm)



| SYMBOL | MIN | MAX |
|--------|-------------|------|
| A | 1.40 | 1.60 |
| B | 0.36 | 0.48 |
| C | 0.35 | 0.44 |
| D | 4.40 | 4.60 |
| D1 | 1.62 | 1.83 |
| E | 2.29 | 2.60 |
| e | 1.50 (TYP.) | |
| e1 | 3.00 (TYP.) | |
| H | 3.94 | 4.25 |
| L | 0.89 | 1.20 |

● SOT-89 MARKING

| Part No. | Marking |
|-----------|---------|
| SS6732-33 | AR33 |
| SS6732-34 | AR34 |
| SS6732-35 | AR35 |
| SS6732-36 | AR36 |
| SS6732-37 | AR37 |
| SS6732-38 | AR38 |
| SS6732-50 | AR50 |
| SS6732-52 | AR52 |

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