FS3356

High Input Linear Voltage Regulator

General Description

The FS3356 series is a high input voltage, lowquiescent current, High PSRR linear regulator (LDO) able to provide 150mA load current. The LDO features very fast response against line voltage transient and load current transient, and ensures no overshoot voltage during the LDO start up and short circuit recovery.

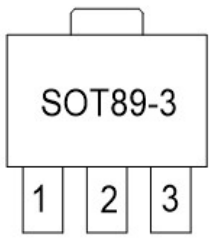
Features

- High withstand voltage： 100V
- High Operating Voltage： Up to 80V
- Output Current： 150mA
- High PSRR： 70dB at 1Khz
- Fixed Output Voltages：
  3.0V, 3.3V, 3.6V and 5.0V
- High-accuracy Output Voltage: ±2%
- Good Transient Response
- Integrated Short-Circuit Protection
- Integrated Thermal Protection

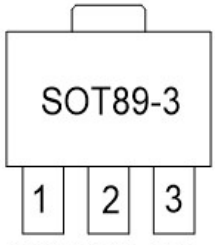
Applications

- Battery-powered equipment
- Smoke detector and sensor
- Micro controller Applications
- Home Appliance

Pin Configuration

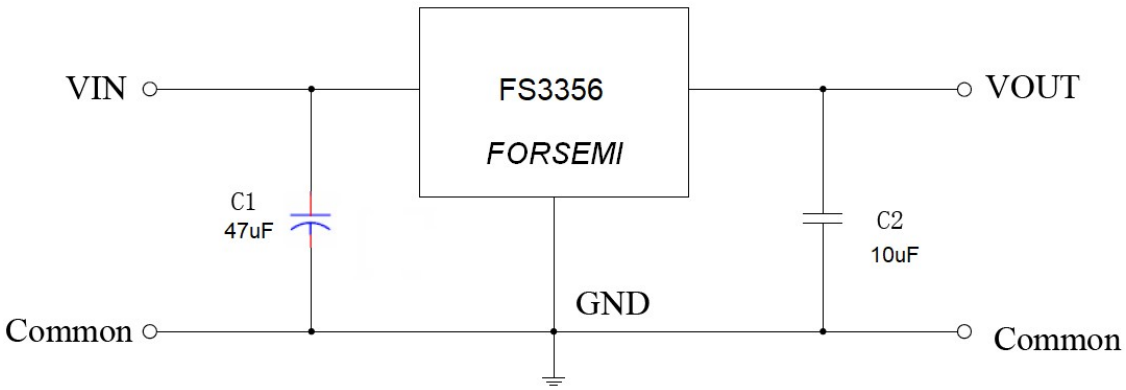


FS3356-XX-SM-N



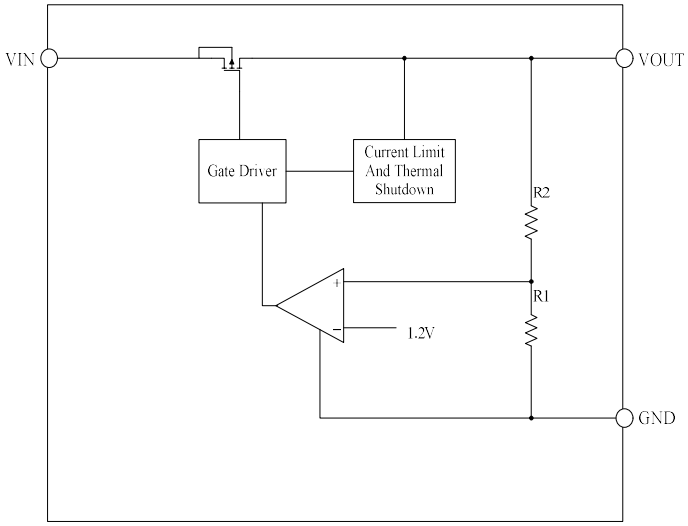
FS3356-XX-SM-G

Typical Application Circuit

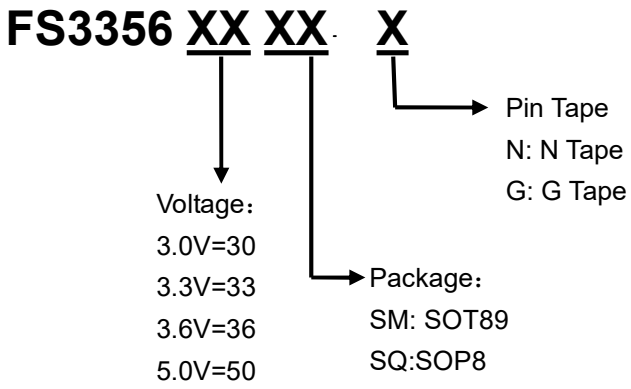


NOTE:, To ensure input stability, A minimum capacitor of C1=47μF Aluminum recommended For ***HOT PLUG*** application

Block Diagram



Ordering Information



Absolute Maximum Ratings

Item	Description	Min	Max	Unit
Voltage	VIN to GND	-0.3	100	V
	VOUT to GND	-0.3	8	V
Current	Peak output current	Internally limited		
Temperature	Operating Ambient Temperature	-40	85	℃
	junction Temperature	-	150	℃
Thermal Resistance (Junction to Ambient)	SOT89	180		℃/W

Note. Stresses listed as the above "Maximum Ratings" may cause permanent damage to the device. Exposure to maximum rating conditions for extended periods may remain possibility to affect device reliability.

Electrical Characteristics

（At T_A=25° C, C_{IN}=47uF, C_{OUT}=10uF, unless otherwise noted）

Symbol	Parameter	Test Conditions	MIN	TYP	MAX	UNIT
VIN	Operating Voltage		5	—	80	V
IGND	Quiescent Current	VIN=12V, No load	—	3	—	uA
VOUT	Output Voltage	VIN=12V, IOUT=10mA	VOUTNOM * 0.98	VOUTNOM	VOUTNOM * 1.02	V
IOUT_MAX	Output Current		—	150	—	mA
VDROP	Dropout Voltage(4)	IOUT=10mA , VIN=VOUTNOM-0.1V	—	70	—	mV
		IOUT=100mA , VIN=VOUTNOM-0.1V	—	700	—	mV
ΔVOUT(ΔIOUT)	Load Regulation	VIN=12V, 1mA≤IOUT≤100mA	—	0.02	—	%/mA
ΔVOUT(ΔVIN)	Line Regulation	IOUT=1mA, VOUTNOM+0.5V≤VIN≤60V	—	0.01	—	%/V
ILIMIT	Current Limit		—	250	—	mA
TSHDN	Thermal Shutdown Temperature	Shutdown, temperature increasing	—	150	—	℃
		Reset, temperature decreasing	—	140	—	
PSRR		Vin=12V , Iout=10mA F=1Khz,Vout=3.3V	—	70	—	dB

Note1.

Stresses listed as the above "Maximum Ratings" may cause permanent damage to the device.

Note2.

These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied.

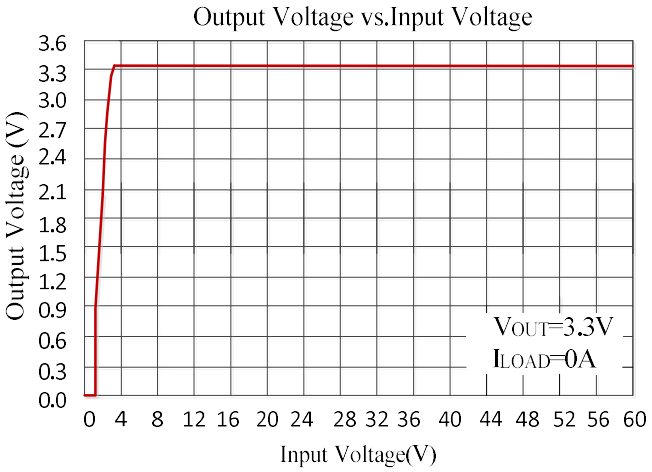
Note3.

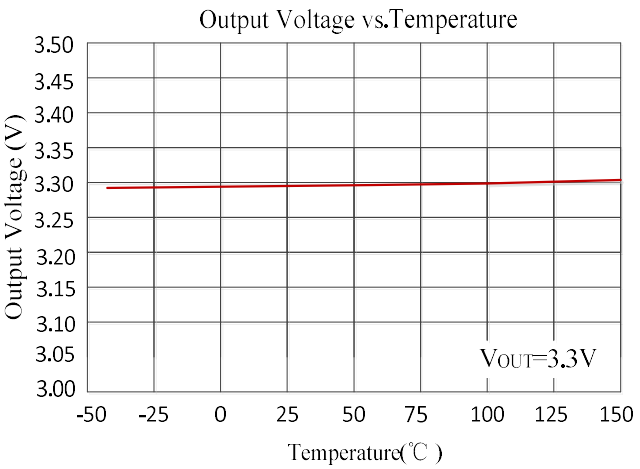
Exposure to maximum rating conditions for extended periods may remain possibility to affect device reliability.

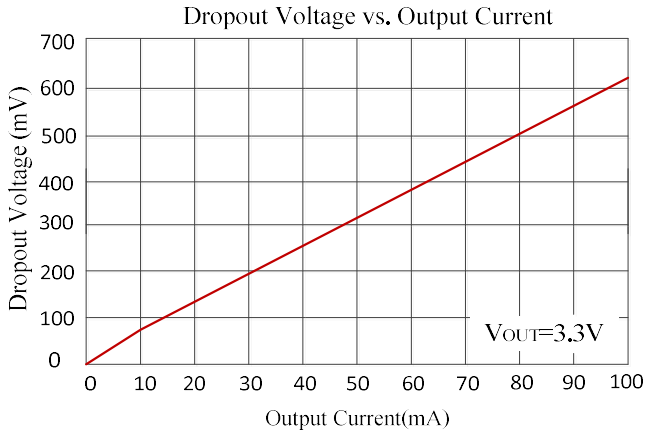
Note4.

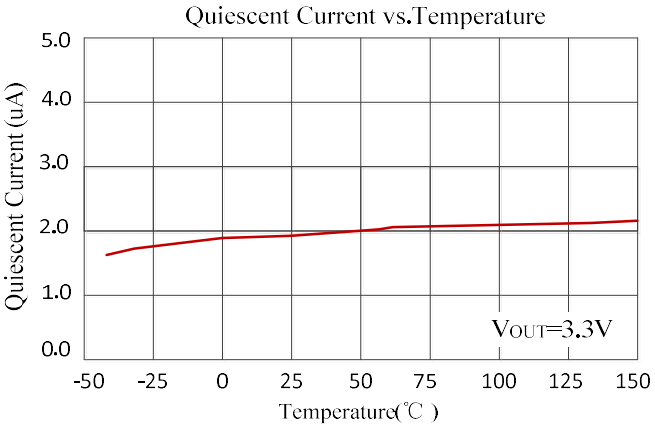
Dropout Voltage is the voltage difference between the input and the output at which the output voltage drops 2% below its nominal value.

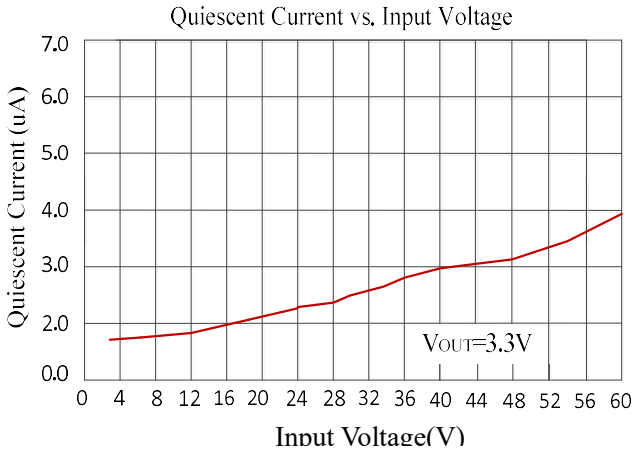
Typical Performance Characteristics

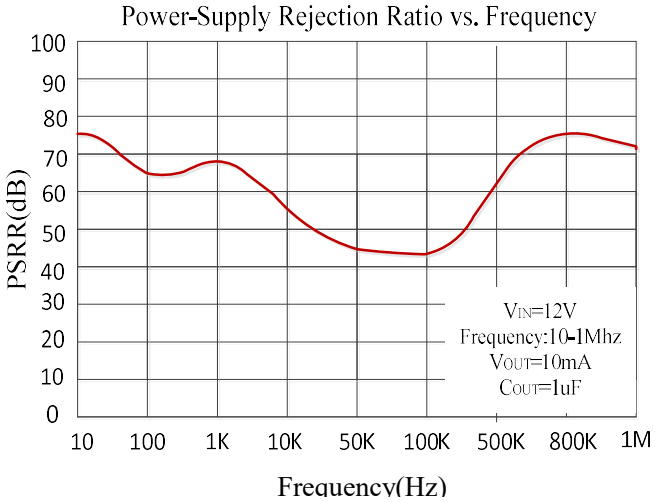




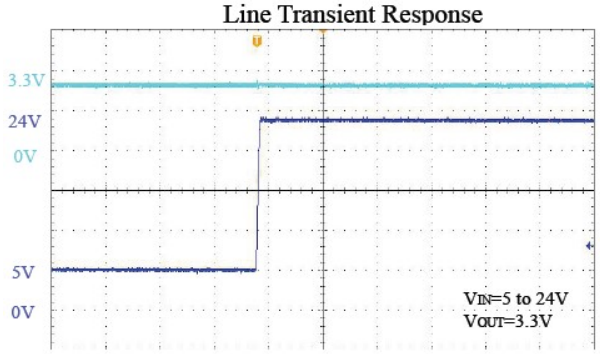






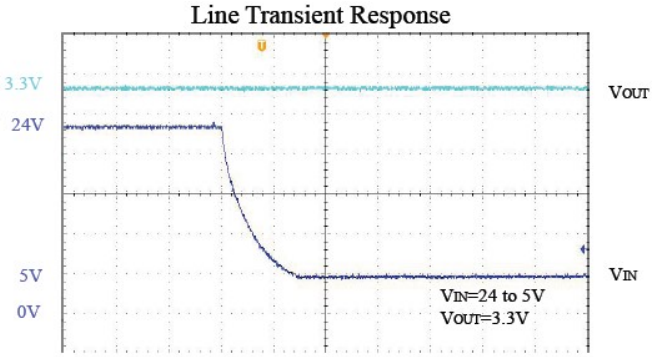


Line Transient Response



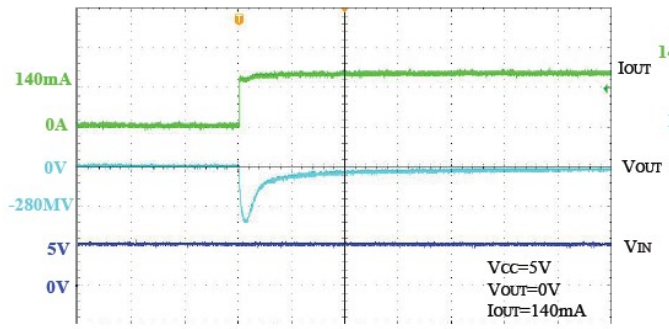
Time(4us/div)

Line Transient Response



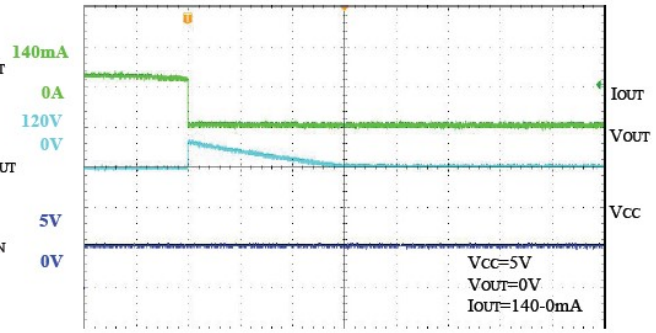
Time(4us/div)

Load Transient Response



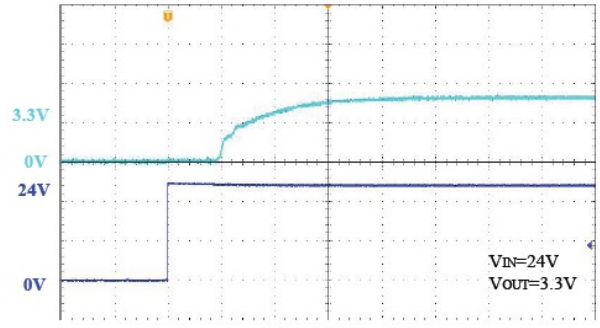
Time(20us/div)

Load Transient Response



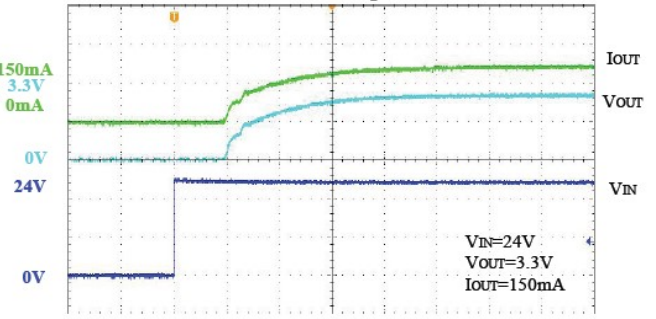
Time(200us/div)

Start Up



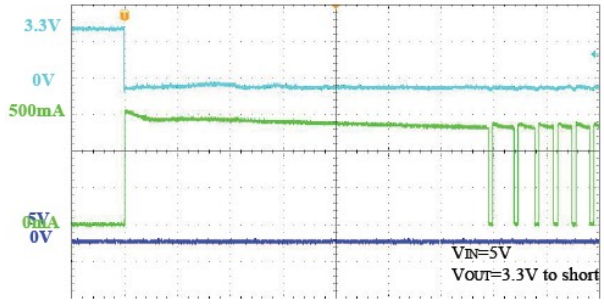
Time(100us/div)

Start Up



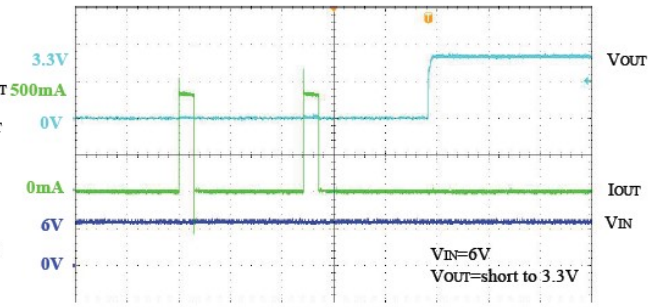
Time(100us/div)

Short Circuit Protection



Time(20ms/div)

Short Circuit Protection



Time(2ms/div)

Functional Description

Input Capacitor

A 47µF Aluminum capacitor is recommended to connect between VIN and GND pins to decouple input power supply glitch and noise. The amount of the capacitance may be increased without limit. This input capacitor must be located as close as possible to the device to assure input stability and less noise. For PCB layout, a wide copper trace is required for both VIN and GND.

Output Capacitor

An output capacitor is required for the stability of the LDO. The recommended minimum output capacitance is 1µF, ceramic capacitor is recommended, and temperature characteristics are X7R or X5R. Higher capacitance values help to improve load/line transient response. The output capacitance may be increased to keep low undershoot/overshoot. Place output capacitor as close as possible to VOUT and GND pins.

Current Limit and Short Circuit Protection

When output current at VOUT pin is higher than current limit threshold or the VOUT pin is direct short to GND, the current limit protection will be triggered and clamp the output current at a pre-designed level to prevent over-current and thermal damage.

Thermal Protection

The FS3356 has internal thermal sense and protection circuits. When excessive power dissipation happens on the device, such as short circuit at the output pin or very heavy load current with a large voltage drop across the device, the internal thermal protection circuit will be triggered, and it will shut down the power MOSFET to prevent the LDO from damage. As soon as excessive thermal condition is removed and the temperature of the device drops down, the thermal protection circuit will lease the control of the power MOSFET, and the LDO device goes to normal operation.