RT9182

General Description

The RT9182 is a dual-channel, low noise, and low dropout regulator supplying up to 200mA current at each channel. The output voltage ranges from 1.5V to 3.3V in 100mV increments and 2% accuracy by operating from a +2.7V to +5.5V input.

The RT9182 uses an internal PMOS as the pass device, which consumes 165μA supply current (both LDOs on) independent of load current and dropout conditions. The EN1 and EN2 pins control each output respectively. When both outputs shutdown simultaneously, the chip will be turn off and consumes nearly zero operation current which is suitable for battery-power devices. Other features include a current limiting, and over temperature protection.

Ordering Information

RT9182 □ □ □

Package Type
ES : SOT-23-6

Operating Temperature Range
P : Pb Free with Commercial Standard
G : Green (Halogen Free with Commercial Standard)

Output Voltage
A : 2.8V (Output1), 2.8V (Output2)
B : 3.0V (Output1), 3.0V (Output2)
C : 2.8V (Output1), 3.0V (Output2)
D : 2.8V (Output1), 2.5V (Output2)
E : 2.8V (Output1), 1.8V (Output2)
F : 2.5V (Output1), 2.5V (Output2)
G : 2.5V (Output1), 1.8V (Output2)
H : 3.3V (Output1), 2.5V (Output2)
I : 3.3V (Output1), 1.8V (Output2)
J : 3.0V (Output1), 2.5V (Output2)
K : 3.0V (Output1), 1.8V (Output2)
L : 2.8V (Output1), 1.85V (Output2)

Features

- **Up to 200mA Output Current (Each LDO)**
- **Dual Shutdown Pins Control Each Output**
- **124μV_{RMS} Low Noise Output**
- **Current Limiting and Thermal Protection**
- **Short Circuit Protection**
- **120mV Dropout at 100mA Load**
- **Two LDOs in SOT-23-6 Package**
- **RoHS Compliant and 100% Lead (Pb)-Free**

Applications

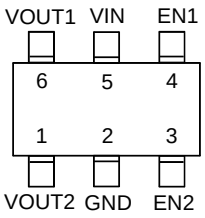
- Cellular Phones
- Laptop, Notebook, and Palmtop Computers
- Battery-powered Equipment
- Hand-held Equipment
- Wireless LAN

Marking Information

For marking information, contact our sales representative directly or through a RichTek distributor located in your area, otherwise visit our website for detail.

Pin Configurations

(TOP VIEW)

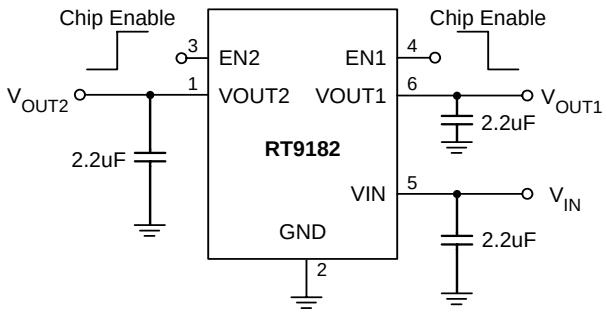


SOT-23-6

Note : There is no pin1 indicator on top mark for SOT-23-6 type, and pin 1 will be lower left pin when reading top mark from left to right.

RT9182

Typical Application Circuit

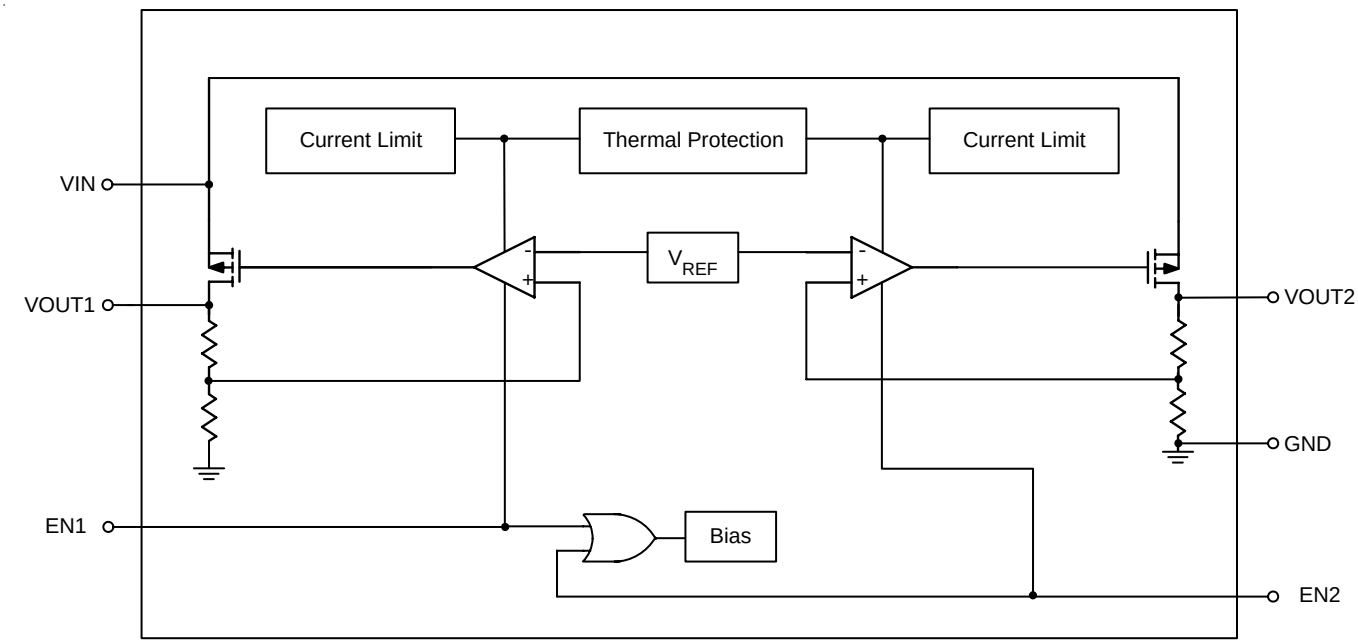


Functional Pin Description

Pin No.	Pin Name	Pin Function
1	VOUT2	Channel 2 Output Voltage
2	GND	Common Ground
3	EN2 Note	Chip Enable (Active High)
4	EN1 Note	Chip Enable (Active High)
5	VIN	Supply Input
6	VOUT1	Channel 1 Output Voltage

Note: If EN1 and EN2 are both low, both regulators and the reference turn off.

Function Block Diagram



Absolute Maximum Ratings (Note 1)

- Supply Input Voltage ---------- 6.5V
- Power Dissipation, P_D @ T_A = 25°C
  SOT-23-6 ---------- 0.4W
- Package Thermal Resistance (Note 5)
  SOT-23-6, θ_{JA} ---------- 250°C/W
- Lead Temperature (Soldering, 10 sec.) ---------- 260°C
- Storage Temperature Range ---------- –65°C to 150°C
- ESD Susceptibility (Note 2)
  HBM (Human Body Mode) ---------- 2kV
  MM (Machine Mode) ---------- 200V

Recommended Operating Conditions (Note 3)

- Supply Input Voltage ---------- 2.7V to 5.5V
- Enable Input Voltage ---------- 0V to 5.5V
- Junction Temperature Range ---------- –40°C to 125°C

Electrical Characteristics

(V_{IN} = 3.6V, C_{IN} = C_{OUT} = 2.2µF, EN1 = EN2 = V_{IN}, typical values at T_A = 25°C, for each LDO unless otherwise specified.)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Output Voltage Accuracy (Load Regulation)	ΔV_{OUT}	I_L = 1mA to 200mA	-2	--	+2	%
Maximum Output Current	I_{MAX}	Continuous	200	--	--	mA
Current Limit	I_{LIM}	R_{LOAD} = 1Ω	500	--	1000	mA
Quiescent Current	I_G	No Load	--	165	260	µA
		I_{OUT} = 100mA (Both LDOs)	--	165	260	µA
Dropout Voltage (Note 4)	V_{DROP}	I_{OUT} = 1mA	--	1.2	--	mV
		I_{OUT} = 100mA	--	120	--	mV
		I_{OUT} = 200mA	--	255	--	mV
Line Regulation	ΔV_{LINE}	V_{IN} = (V_{OUT} +0.4V or 2.7V) to 5.5V I_{OUT} = 1mA	-0.2	--	+0.2	%/V
EN Input High Threshold	V_{IH}	V_{IN} = 2.7V to 5.5V	1.6	--	--	V
EN Input Low Threshold	V_{IL}	V_{IN} = 2.7V to 5.5V	--	--	0.4	V
EN Input Bias Current	I_{SD}	EN = GND or V_{IN}	--	--	100	nA
Shutdown Supply Current	I_{GSD}	EN1 = EN2 = GND	--	0.01	2	µA
Thermal Shutdown Temperature	T_{SD}		--	140	--	°C
Thermal Shutdown Hysteresis	ΔT_{SD}		--	10	--	°C
Output Voltage Noise	e_{NO}	10Hz to 100kHz, C_{OUT} = 4.7µF, I_{LOAD} = 1mA	--	124	--	μV_{RMS}
Output Voltage AC PSRR		100Hz, C_{OUT} = 4.7µF, I_{LOAD} = 100mA	--	62	--	dB

Note 1. Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. 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. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.

Note 2. Devices are ESD sensitive. Handling precaution recommended.

Note 3. The device is not guaranteed to function outside its operating conditions.

Note 4. The dropout voltage is defined as V_{IN} -V_{OUT}, which is measured when V_{OUT} is $V_{OUT(NORMAL)}$ – 100mV.

Note 5. θ_{JA} is measured in the natural convection at T_A = 25°C on a low effective thermal conductivity test board of JEDEC 51-3 thermal measurement standard.