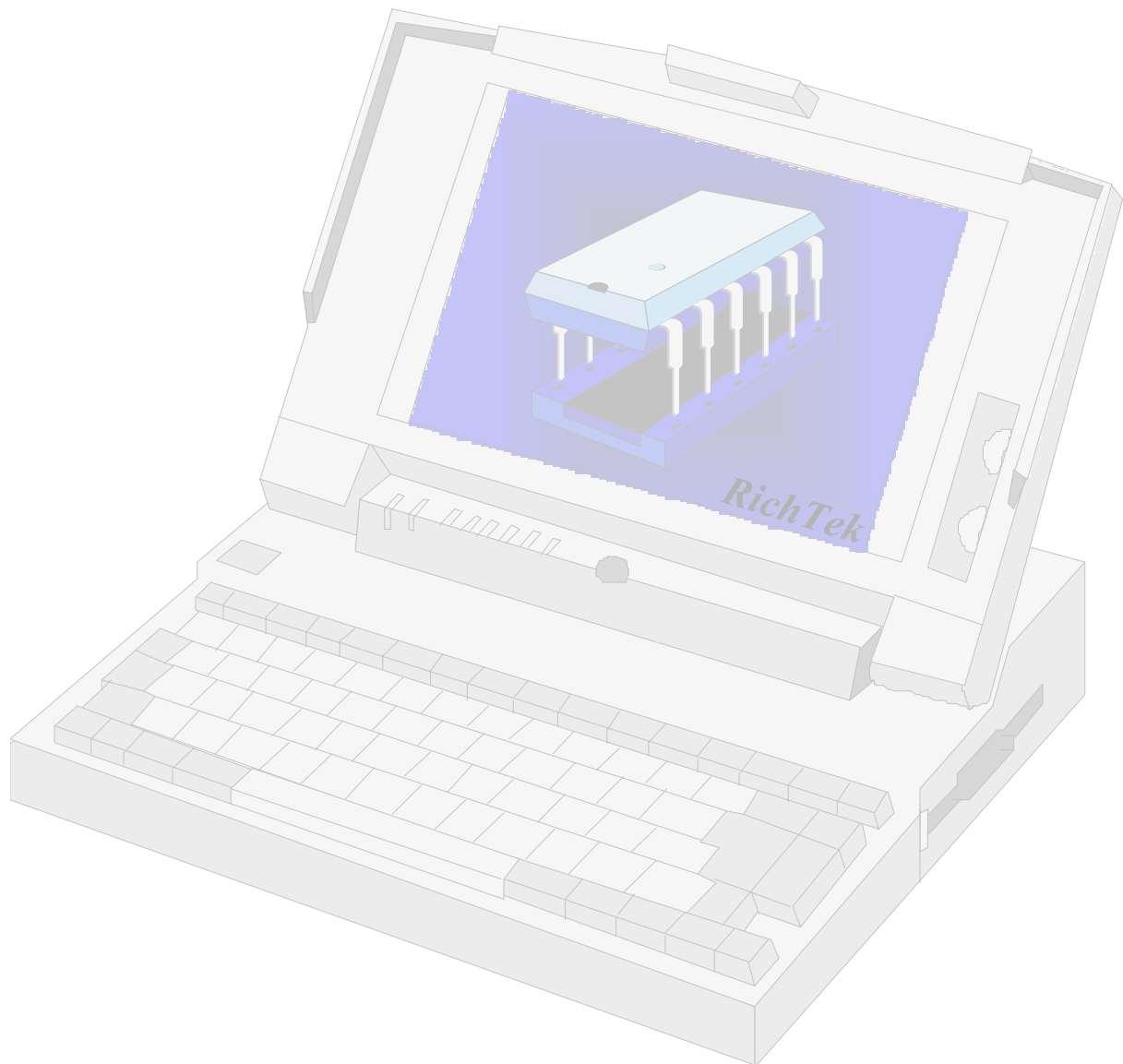


RT9226A Data Sheet



Synchronous PWM Step-down DC/DC Converter Controller

Description

The RT9226A is a low cost, high-efficiency voltage-mode PWM controller for motherboard power supply application. Synchronous N-channel MOSFET driver, short-circuit protection, and soft start function are integrated in a single chip. A simple high power buck regulator with shutdown function can be implemented with minimum external components.

The RT9226A provides current-limit protection by monitoring the voltage drop across N-channel MOSFET in over current condition, therefore, eliminates the current sensing resistor and minimizes the efficiency loss. The soft start function reduces the stress on power supply and components in power on duration. The 200 kHz operating frequency and high speed PWM control loop with Synchronous N-channel MOSFET driver provide optimized compromise between efficiency, cost, and response speed.

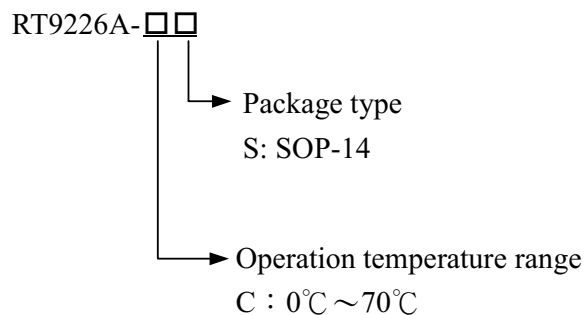
Features

- Synchronous N-channel MOSFET Driver
- High efficiency
- Fast response with 200kHz operating frequency
- Adjustable current limit by sensing MOSFET $r_{DS(ON)}$, without extra current sensing resistor
- Shutdown function

Applications

- Low cost CPU power supply
- Motherboard I/O power supply
- Add-on card power supply
- DDR SDRAM bus terminator power supply

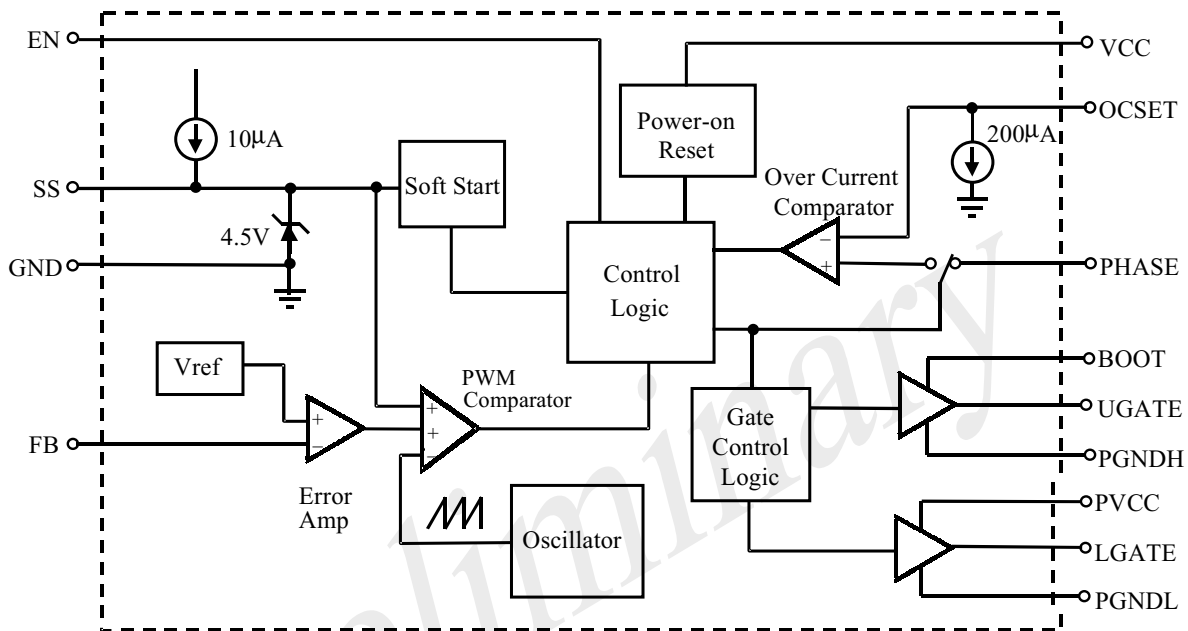
Ordering Information



Pin Configurations

Part Number	Pin Configuration
RT9226ACS (Plastic SOP-14)	<p style="text-align: center;">TOP VIEW</p> <p>NC □ 1 14 □ VCC OCSET □ 2 13 □ PVCC SS □ 3 12 □ LGATE FB □ 4 11 □ PGNDL EN □ 5 10 □ BOOT GND □ 6 9 □ UGATE PGNDH □ 7 8 □ PHASE</p>

Function Block Diagram



Pin Description

Pin No.	Pin Name	Pin Function
1	NC	No connected
2	OCSET	Current limit set pin with 200µA current sink
3	SS	Soft start, connect a capacitor from this pin to GND
4	FB	Voltage-control feedback loop input
5	EN	Regulator enable with low shutdown
6	GND	Ground
7	PGNDH	High side drive GND
8	PHASE	Current limit sense
9	UGATE	High side MOSFET driver output
10	BOOT	Driver power
11	PGNDL	Low side driver GND
12	LGATE	Low side MOSFET driver output
13	PVCC	Driver Power
14	VCC	IC power

Absolute Maximum Ratings

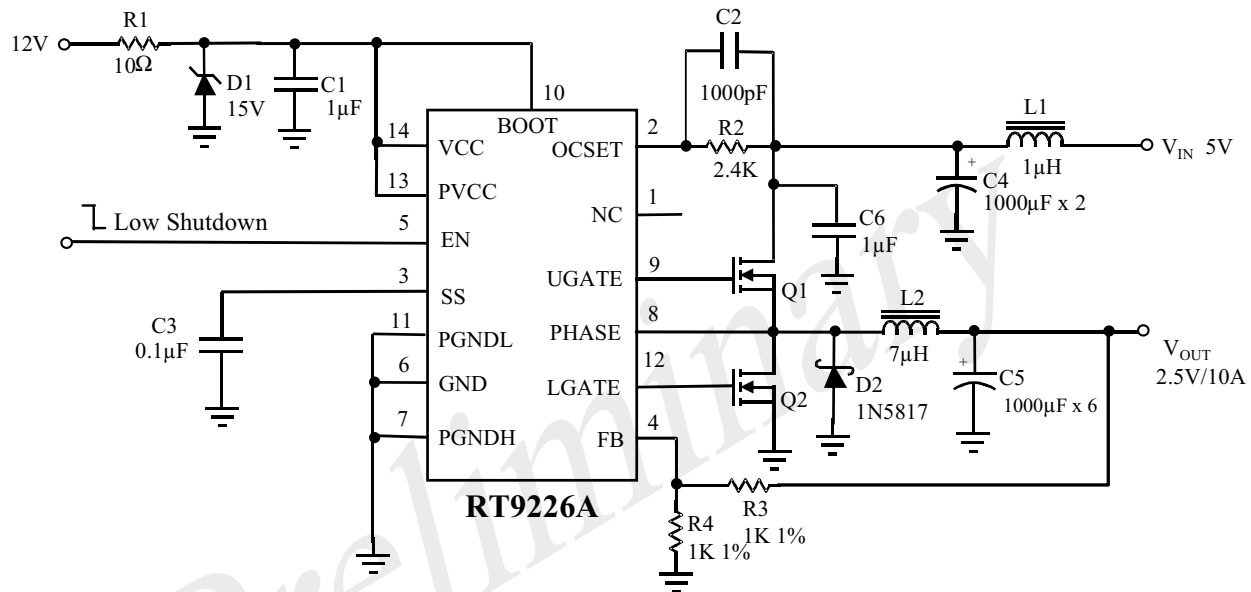
- Supply Voltage (V_{CC}) ----- 15V
- Input, Output or I/O Voltage ----- GND-0.3V to $V_{CC}+0.3V$
- Ambient Temperature Range (T_A) ----- 0°C to 70°C
- Operating Junction Temperature Range (T_J) ----- 0°C to 125°C
- Storage Temperature Range (T_{STG}) ----- -65°C to 150°C
- Power Dissipation and Thermal Characteristics:
 - SOP Plastic Package, P_D @ $T_A=25^\circ C$ ----- 0.625W
 - Thermal Resistance, $R_{\theta JA}$ ----- 160°C/W
- Lead Temperature (Soldering) 10 seconds (T_{LEAD}) ----- 260°C

Electrical Characteristics

$V_{CC}=12V$, $GND=0V$, $T_A=25^\circ C$, unless other wise specified.

Parameter	Symbol	Test condition	Min.	Typ.	Max.	Units
V_{CC} Supply Current						
Nominal Supply Current	I_{CC}	UGATE Open	--	3	--	mA
Power-on Reset						
V_{CC} Rising Threshold		$V_{OCSET}=4.5V$	--	9.5	--	V
V_{CC} Falling Threshold		$V_{OCSET}=4.5V$	--	7.5	--	V
Enable Input Threshold			0.2	--	2.2	V
Oscillator						
Frequency			170	200	230	kHz
Ramp Amplitude			--	1.9	--	V
Internal Voltage Reference						
Reference Voltage	V_{REF}		1.225	1.250	1.275	V
PWM Controller Error Amplifier						
DC Gain			--	65	--	dB
PWM Controller Gate Driver						
UGATE Source	R_{UGATE}	$I_{UGATE}=0.3A$	--	8	--	Ω
UGATE Sink	R_{UGATE}	$I_{UGATE}=0.3A$	--	6	--	Ω
LGATE Source	I_{LGATE}	$V_{CC}=12V$, $V_{LGATE}=6V$	--	500	--	mA
LGATE Sink	R_{LGATE}	$I_{LGATE}=1V$	--	5	--	Ω
Protection						
OCSET Sink Current	I_{OCSET}	$V_{OCSET}=4.5V$	170	200	230	μA
SS Current	I_{SS}	$V_{SS}=1.5V$	--	10	--	μA

Typical Applications



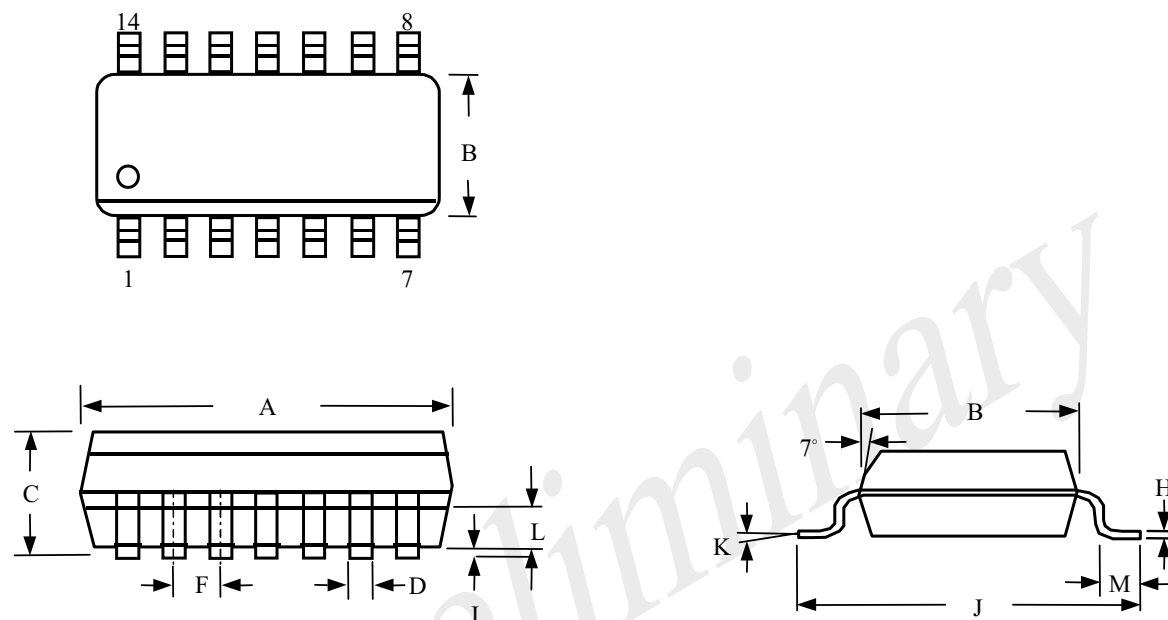
C4, C5: Each 1000μF 6.3WV DC, Sanyo MV-GX or Equivalent.

L1: Core: Micrometals T50-52; Winding: 5 turns of 18 AWG.

L2: Core: Micrometals T60-52; Winding: 14 turns of 17 AWG.

Q1, Q2: CET6030L

Package Information



Symbol	Dimensions in Inch			Dimensions in Millimeter		
	Min	Norm	Max	Min	Norm	Max
A	0.335	0.341	0.346	8.5	8.65	8.8
B	0.150	0.154	0.157	3.8	3.9	4
C	0.053	0.061	0.069	1.35	1.55	1.75
D	0.011	0.016	0.020	0.29	0.4	0.51
F	--	0.002	--	--	0.05	--
H	0.007	0.009	0.010	0.19	0.22	0.25
I	0.004	0.006	0.010	0.1	0.157	0.25
J	0.228	0.236	0.244	5.8	6	6.2
K	--	0.197	0.315	--	5	8
L	0.022	0.025	0.028	0.55	0.625	0.7
M	0.016	--	--	0.4	--	--