

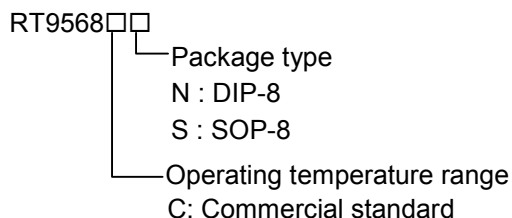
# PSM DC-to-DC Controller

## General Description

The RT9568 is a DC-to-DC controller IC for step-down (Buck), step-up (Boost), inverting (Buck-Boost), and Flyback converters.

The device consists of an internal temperature compensated reference, comparator, controlled duty cycle oscillator with an active current limit circuit, driver, and high current output switch.

## Ordering Information



## Marking Information

Part Number	Marking
RT9568CN	RT9568CN
RT9568CS	RT9568CS

## Features

- Pluse-Skipping Modulation
- Precision  $\pm 2\%$  Reference
- Operation from 3.0V to 30V Input
- Internal Switch Peak Current to 1.5A
- Design Flexibility
- Output Voltage Adjustable
- Current Limiting Adjustable
- Frequency Adjustable up to 200KHz

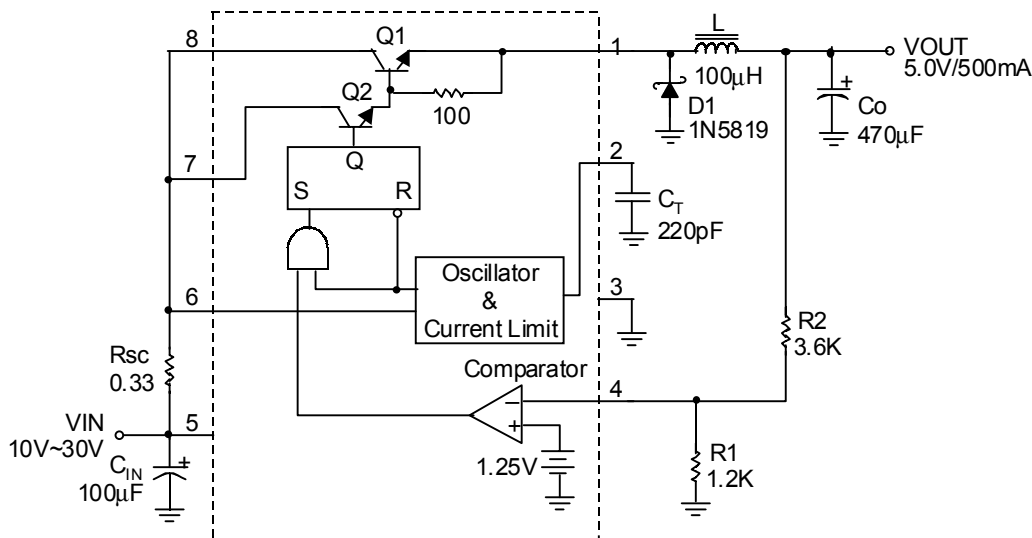
## Applications

- DC-DC Converter Module

## Pin Configurations

Part Number	Pin Configurations
RT9568CN (Plastic DIP-8)	TOP VIEW 
RT9568CS (Plastic SOP-8)	

## Typical Application Circuit



Step-down Cinvter use Internal Switch

## Absolute Maximum Ratings

• Power Supply Voltage .....	30V
• Feedback Input Voltage Range .....	0.3V to V <sub>CC</sub>
• Switch Collector Voltage .....	30V
• Switch Emitter Voltage (V <sub>PIN8</sub> = 30V) .....	30V
• Switch Collector to Emitter Voltage .....	30V
• Driver Collector Voltage .....	30V
• Driver Collector Current (see Note 1) .....	100mA
• Switch Current .....	1.5A
• Power Dissipation, P <sub>D</sub> @ T <sub>A</sub> = 25°C	
DIP-8 .....	1.25W
SOP-8 .....	0.625W
• Package Thermal Resistance	
DIP-8, θ <sub>JA</sub> .....	100°C/W
SOP-8, θ <sub>JA</sub> .....	160°C/W
• Operating Junction Temperature Range .....	-40 ~ 125°C
• Storage Temperature Range .....	-65 ~ 150°C

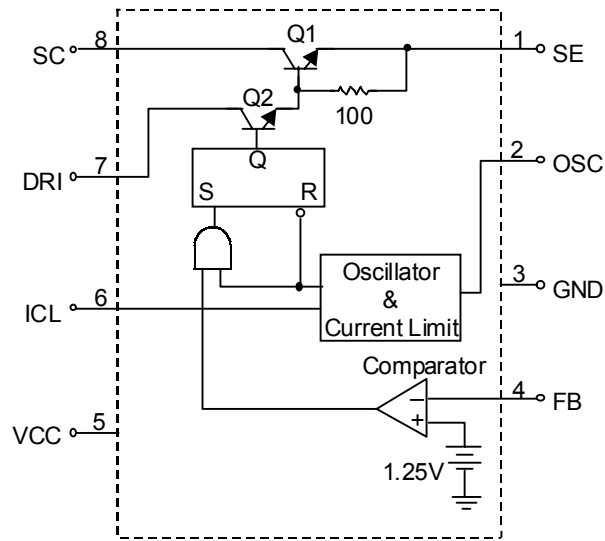
Note: 1. Maximum package power dissipation limits must be observed.

## Electrical Characteristics

(V<sub>CC</sub> = 5V, T<sub>A</sub> = 25°C, unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Supply Current	I <sub>CC</sub>	V <sub>CC</sub> = 5.0V to 30V, C <sub>T</sub> = 1.0nF, Pin6 = V <sub>CC</sub> , V <sub>pin4</sub> > V <sub>ref</sub> , Pin1 = GND, Remaining pins open	--	3.0	4.5	mA
Current Limit Sense Voltage	V <sub>LIMIT</sub>	I <sub>CHG</sub> = I <sub>DISCHG</sub>	280	330	380	mV
Charge Current	I <sub>CHG</sub>	5.0V ≤ V <sub>CC</sub> ≤ 30V	25	36	43	μA
Discharge Current	I <sub>DISCHG</sub>	5.0V ≤ V <sub>CC</sub> ≤ 30V	160	250	290	μA
Discharge to Charge Current Ratio		Pin6 to V <sub>CC</sub>	5.5	6.9	7.9	--
Saturation Voltage, Darlington Connection		I <sub>SW</sub> = 1.0A, Pins 7,8 connected	--	1.0	1.3	V
Saturation Voltage, Darlington Connection		I <sub>SW</sub> = 1.0A, R <sub>PIN7</sub> = 82Ω to V <sub>CC</sub> Forced β ≅ 20	--	0.5	0.7	V
DC Current Gain		I <sub>SW</sub> = 1.0A, V <sub>CE</sub> = 5.0V	50	75	--	--
Collector Off-state Current		V <sub>CE</sub> = 30V	--	0.01	100	μA
Reference Voltage	V <sub>REF</sub>		1.225	1.25	1.275	V
Reference Voltage Line Regulation		3.0V ≤ V <sub>CC</sub> ≤ 30V	--	1.4	5.0	mV
Input Bias Current	I <sub>BIAS</sub>	V <sub>IN</sub> = 0V	--	-20	-400	nA

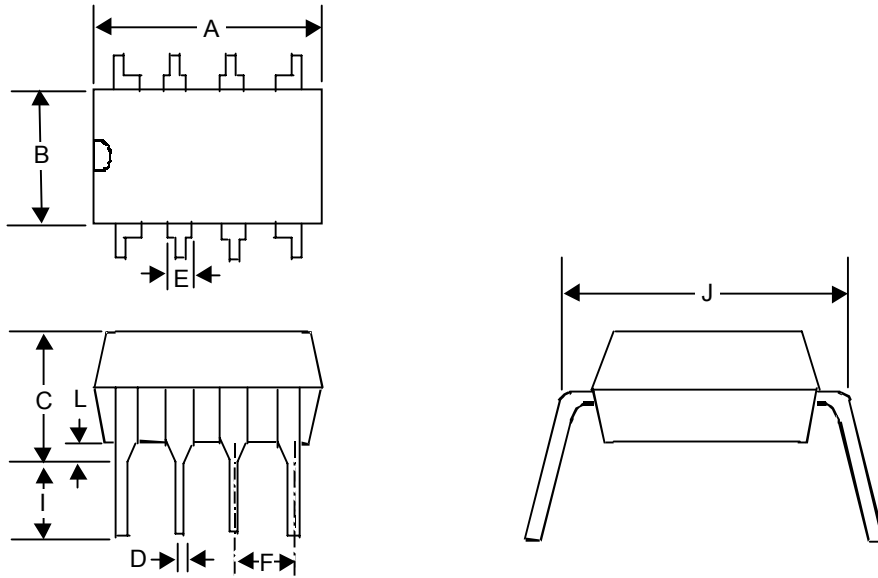
**Function Block Diagram**



**Pin Description**

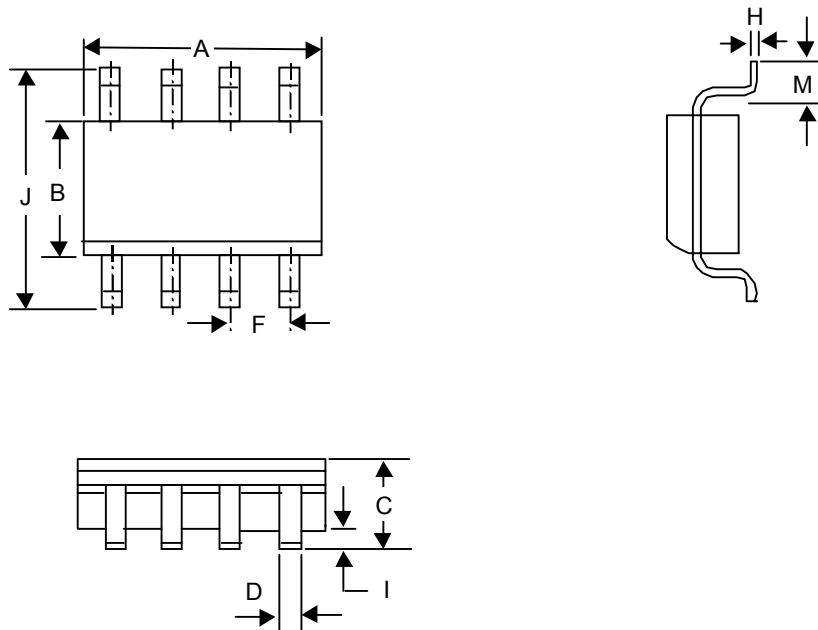
Pin Name	Pin Function
SE	Darlington Switch Emitter
OSC	Oscillator Timing Capacitor
GND	Ground
FB	Feedback Input Pin
VCC	Power Supply Input
ICL	Current Limit Voltage Input
DRI	Driver Collector
SC	Collector of Darlington Transistor

Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	9.068	9.627	0.357	0.379
B	6.198	6.604	0.244	0.260
C	--	4.318	--	0.170
D	0.356	0.559	0.014	0.022
E	1.397	1.651	0.055	0.065
F	2.337	2.743	0.092	0.108
I	3.048	3.556	0.120	0.140
J	7.366	8.255	0.290	0.325
L	0.381	--	0.015	--

8-Lead DIP Plastic Package



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.801	5.004	0.189	0.197
B	3.810	3.988	0.150	0.157
C	1.346	1.753	0.053	0.069
D	0.330	0.508	0.013	0.020
F	1.194	1.346	0.047	0.053
H	0.178	0.254	0.007	0.010
I	0.102	0.254	0.004	0.010
J	5.791	6.198	0.228	0.244
M	0.406	1.270	0.016	0.050

**8-Lead SOP Plastic Package**

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