



## Descriptions

The SG3524N is a pulse width modulation circuit for switching power supplies. It contains a reference voltage source, error amplifier, oscillator, pulse width modulation and pulse width control Flip-flop, dual alternating output current limiting circuit and turn-off circuit. The circuit can be used for switching power supply control of any polarity, transformer-coupled DC-DC switching power supply, transformer pressurization and polarity conversion and other power supply applications.

SG3524N operating temperature is 0°C to +70°C.

## Feature

- Total power consumption is less than 10mA
- With a 5V reference voltage source
- Good external synchronization function
- Contains two 50mA outputs
- Contains a current limiting circuit. Complete
- PWM control circuit
- Single-ended or push-pull output
- 100 Hz ~ 300 khz oscillation frequency range

## Applications

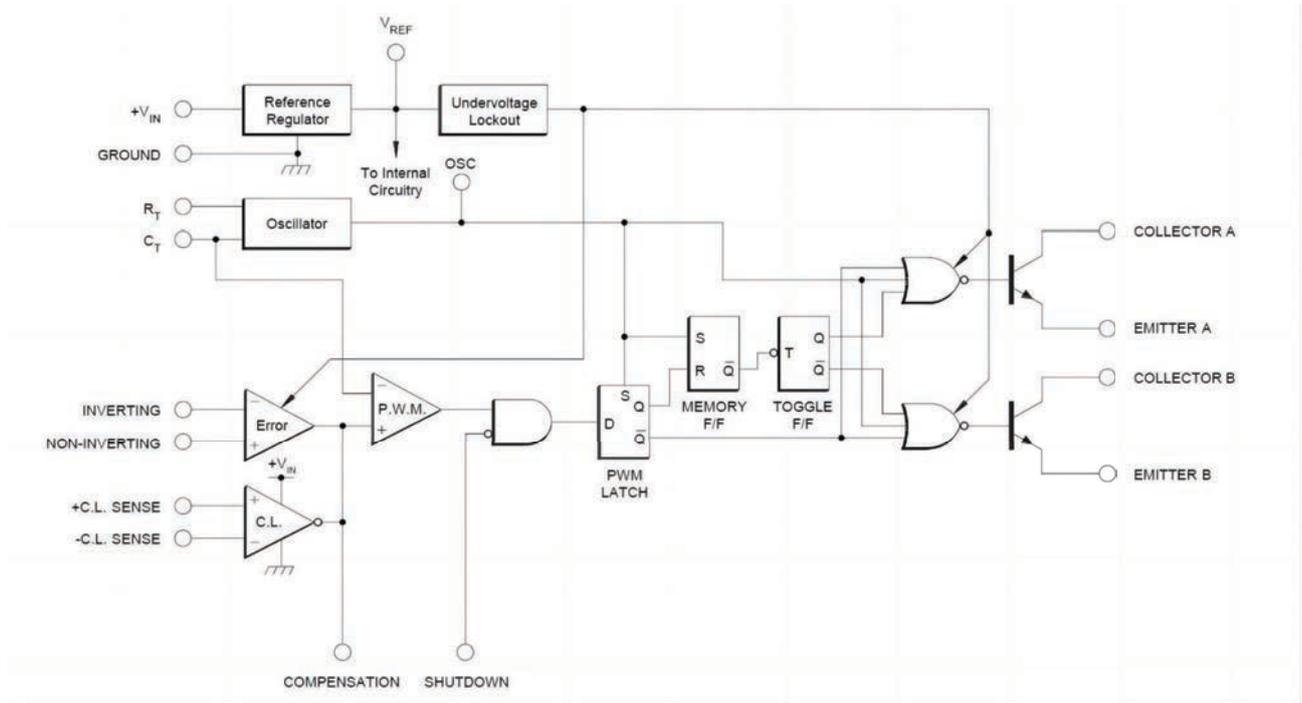
- Transformer coupled DC/DC converter
- Switching regulator with arbitrary polarity

## Ordering Information

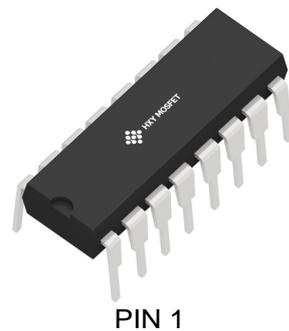
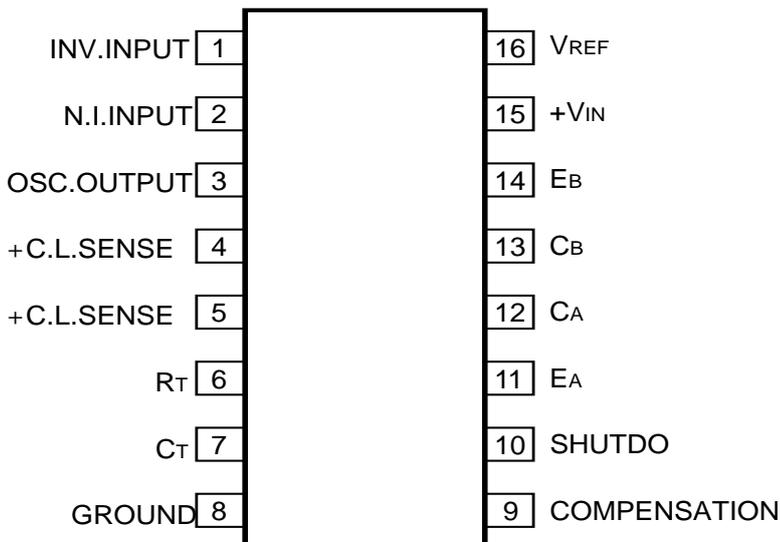
Product Model	Package Type	Packing	Packing Qty
SG3524N	DIP-16(PDIP-16-16)	Tube	25Pcs/Box



## Functional block diagram



## Pin Diagram



PIN 1



## Absolute Maximum Ratings

(If no other provisions,  $T_{amb}=25^{\circ}\text{C}$  )

Parameter	Value	Unit
input voltage( $V_{in}$ )	42	V
collector voltage	40	V
logic input voltage	-0.3~5.5	V
Current-limiting pin differential input( $V_{sense}$ )	-0.3~0.3	V
Each output current	100	mA
Voltage reference load	40	mA
Oscillating end charging current	5	mA
Working junction temperature	150	$^{\circ}\text{C}$
operating ambient temperature	0~70	$^{\circ}\text{C}$

## Recommended working conditions

Parameter	Value	Unit
input voltage( $V_{in}$ )	8~40	V
collector voltage	0~40	V
Error amplifier common-mode input voltage	1.8~3.4	V
Current-limiting pin differential input( $V_{sense}$ )	-0.3~0.3	V
Each output current	0~50	mA
Voltage reference load	0~20	mA
Oscillating end charging current	0.03~2	mA
oscillation frequency	0.1~300	KHz
oscillation resistance( $R_t$ )	1.8~100	K $\Omega$
Oscillation capacitance( $C_t$ )	1~1000	nF
Working junction temperature	150	$^{\circ}\text{C}$
operating ambient temperature	0~70	$^{\circ}\text{C}$



## Electric parameter

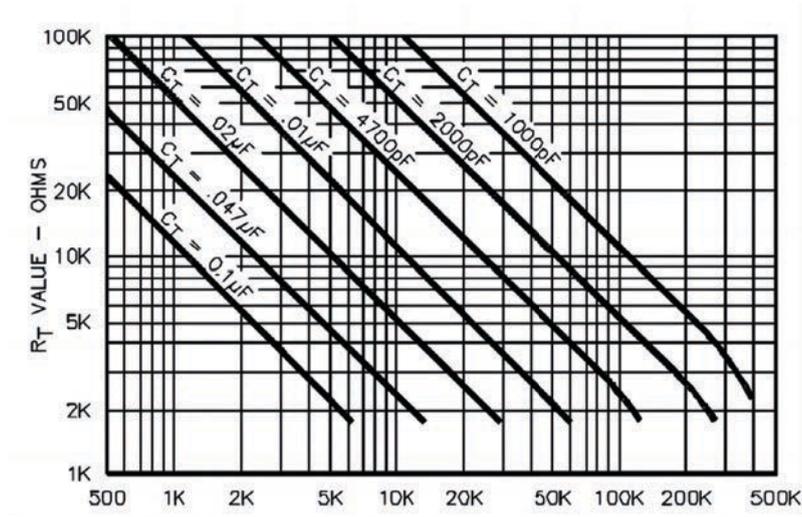
(Without special instructions,  $V_{in}=20V$ ,  $T_A=25^{\circ}C$ )

Symbol	Parameter	Condition	SG 3524N			Unit
			Min.	Typ.	Max.	
Vref	Output Voltage		4.8	5.0	5.2	V
Line Reg	Voltage linearity	$V_{in}=8V\sim 40V$			30	mV
Load Reg	Load linearity	$I_L = 0$ to 20mA			50	mV
Short current	Reference short-circuit current	$V_{REF} = 0V$	25		150	mA
Fosc	Oscillation Frequency		36		44	KHz
	Frequency Voltage Drift	$V_{IN} = 8V$ to 40V			1	%
MaxFosc	Maximum Frequency of Oscillation	$R_T = 2K$ , $C_T = 1nF$	200	400		KHz
	Peak of Oscillation		3		3.9	V
	Valley Value of Oscillation Waveform		0.6		1.2	v
Pulse Width	Oscillation Pulse Width		0.3		1.5	us
Vio	Input Offset Voltage				10	mV
Ib	Input Bias Current				10	uA
Iio	Input Offset Current				2	uA
Av	Dc Open Loop Gain		60			dB
Vol	Output Low Level	$V_{PIN 1} - V_{PIN 2} > 150mV$		0.2	0.5	V
Voh	Output High Level	$V_{PIN 2} - V_{PIN 1} > 150mV$	3.8	4.2		V
CMR	Common Mode Rejection	$V_{CM} = 1.8V$ to 3.4V	70			dB
Min Duty	Minimum Duty Cycle	$V_{COMP} = 0.5V$			0	%
Max Duty	Maximum Duty Cycle	$V_{COMP} = 3.6V$	45	49		%
Vsense	Input Threshold Voltage		180		220	mV
Ib	Input Bias Current				200	uA
Vth	Threshold Voltage Is Turned Off		0.5	0.8	1.2	V
Cleak	Collector Leakage Current	$V_{CE} = 40V$			50	uA
Vcsat	Collector Pressure Drop	$I_C = 50mA$			2	v
Ve	Emitter output voltage	$I_E = 50mA$	17			V
Rise time	Collector output rise time	$R_C = 2K$			0.4	us
Fall time	Collector output drop time	$R_C = 2K$			0.2	us
Icc	Static working current	$V_{IN} = 40V$			10	mA

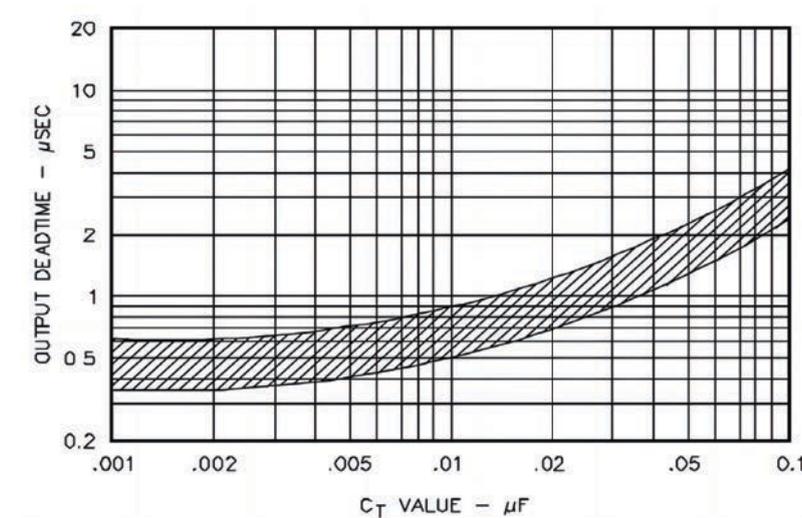


## Applications and notes

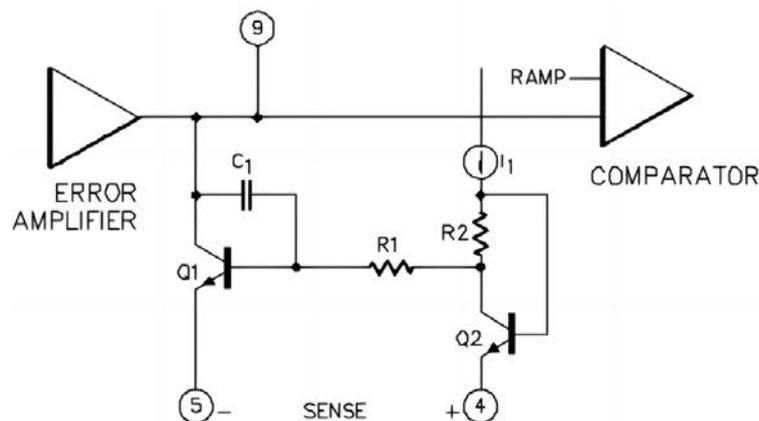
1. Table 1(Relation between oscillation frequency and Rt and Ct)



2. Table 2 (Relationship between dead zone time and Ct)



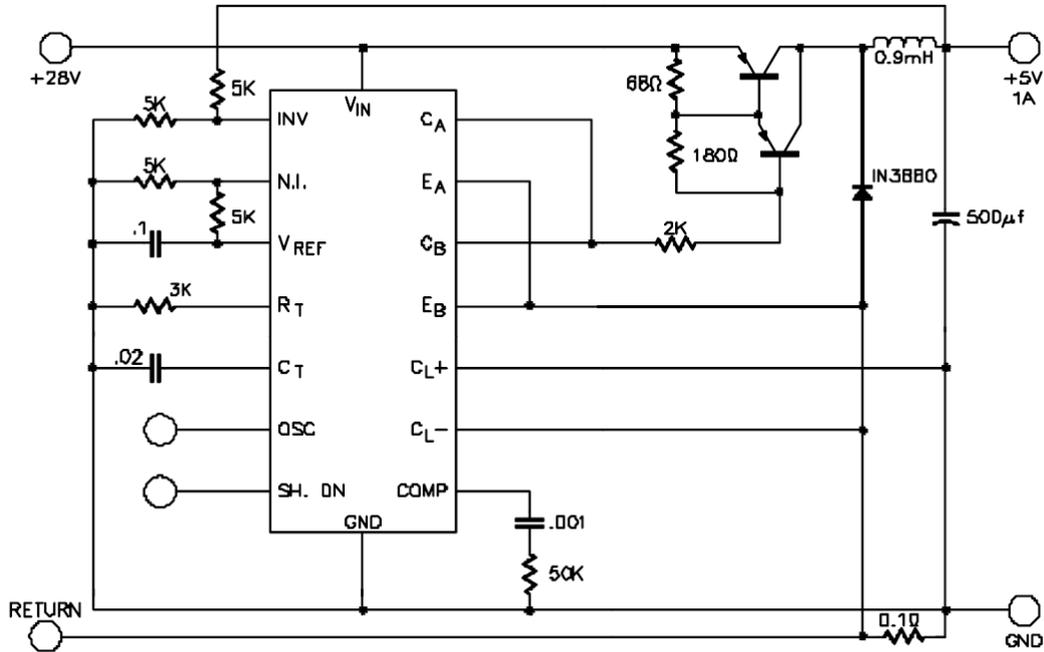
3. Internal current limiting circuit diagram



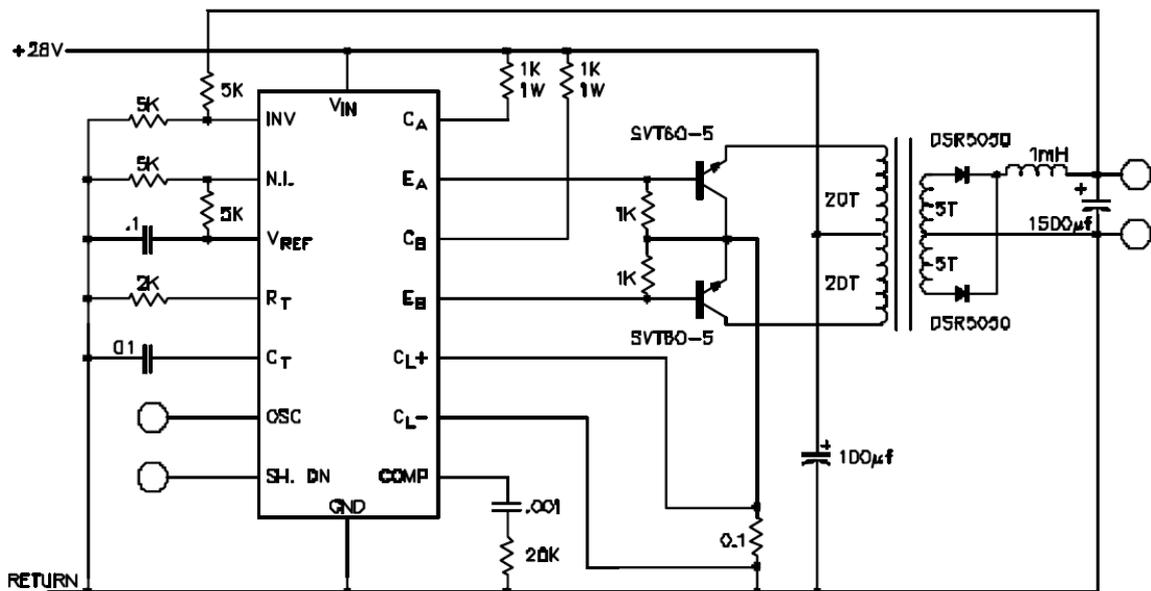
$$\begin{aligned} \text{C.L. Threshold} &= V_{BE}(Q1) + I_1 \cdot R_2 - V_{BE}(Q2) = I_1 \cdot R_2 \\ &\sim 200 \text{ mV} \end{aligned}$$



4. Single-end output application (terminal output control can reach 0~90% duty cycle)



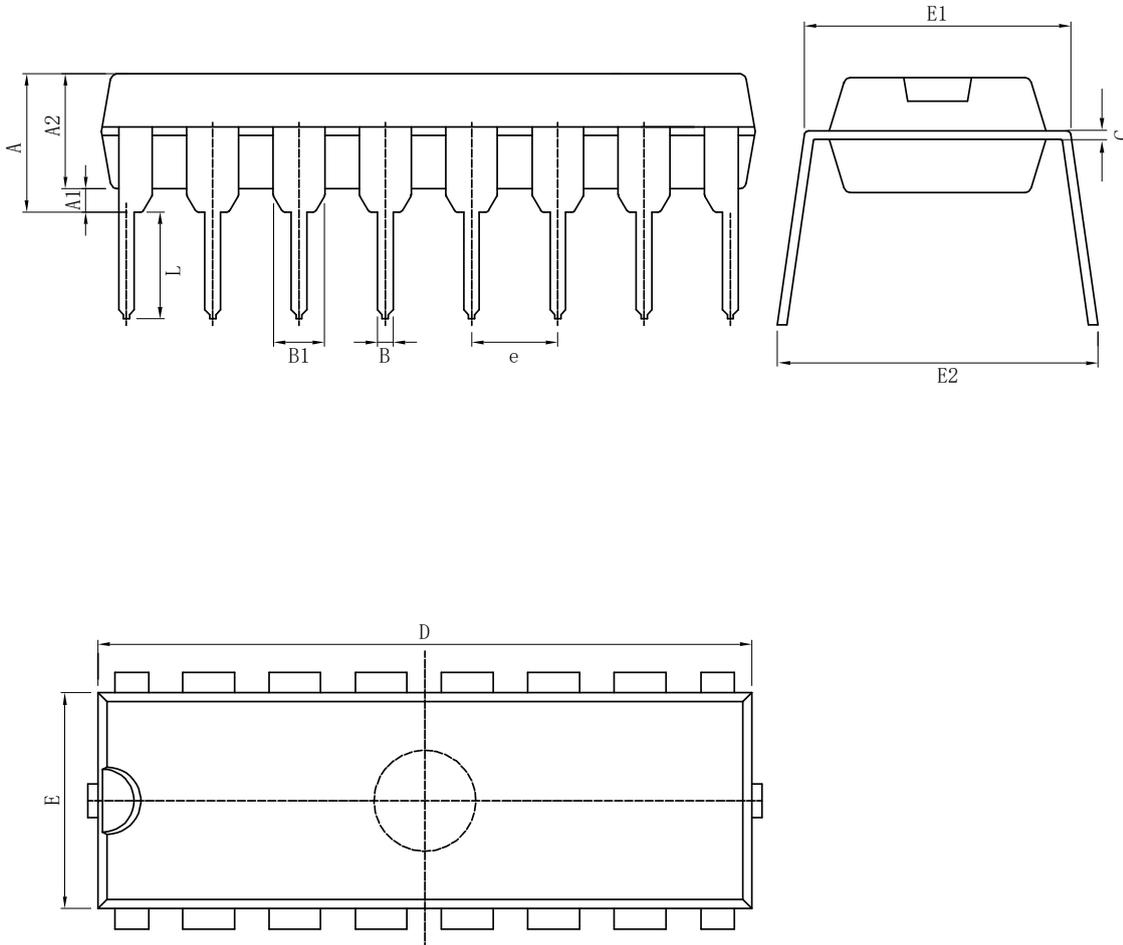
5. Push-pull output application





## Package Information

### DIP-16(PDIP-16)



Size Symbol	Dimensions In Millimeters		Size Symbol	Dimensions In Inches	
	Min( mm )	Max( mm )		Min( in )	Max( in )
A	3.710	4.310	A	0.146	0.170
A1	0.510		A1	0.020	
A2	3.200	3.600	A2	0.126	0.142
B	0.380	0.570	B	0.015	0.022
B1	1.524(BSC)		B1	0.060(BSC)	
C	0.204	0.360	C	0.008	0.014
D	18.80	19.20	D	0.740	0.756
E	6.200	6.600	E	0.244	0.260
E1	7.320	7.920	E1	0.288	0.312
e	2.540(BSC)		e	0.100(BSC)	
L	3.000	3.600	L	0.118	0.142
E2	8.400	9.000	E2	0.331	0.354



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