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XINBOLE

Product Specification

XBLW SG3524

Pulse width modulation circuit of switching power supply

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Summarize

The SG3524 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.
SG3524 operating temperature is 0℃ to +70℃.

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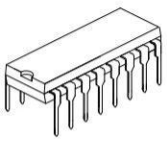

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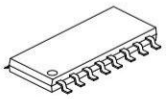


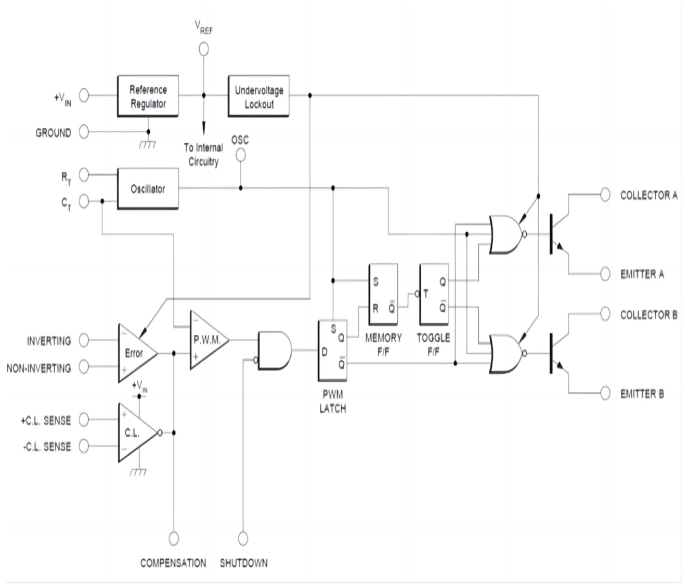
Characteristic

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

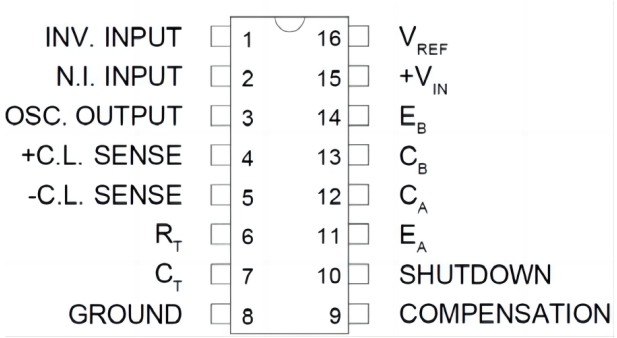
Ordering information

Product Model	Package Type	Marking	Packing	Packing Qty
XBLW SG3524N	DIP-16	SG3524N	Tube	1000Pcs/Box
XBLW SG3524DTR	SOP-16	SG3524	Tape	2500Pcs/Reel

Functional block diagram



Pin diagram



limit value

(Absolute maximum rating, if no other provisions, Tamb=25℃)

Name (Symbol)	Price	Unit
input voltage(Vin)	42	V
collector voltage	40	V
logic input voltage	-0.3~5.5	V
Current-limiting pin differential input(Vsense)	-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	℃
operating ambient temperature	0~70	℃

Recommended working conditions

Name (Symbol)	Price	Unit
input voltage(Vin)	8~40	V
collector voltage	0~40	V
Error amplifier common-mode input voltage	1.8~3.4-	V
Current-limiting pin differential input(Vsense)	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(Rt)	1.8~100	KΩ
Oscillation capacitance(Ct)	1~1000	nF
Working junction temperature	150	℃
operating ambient temperature	0~70	℃

Electric parameter

(Without special instructions, Vin=20V, TA=25℃)

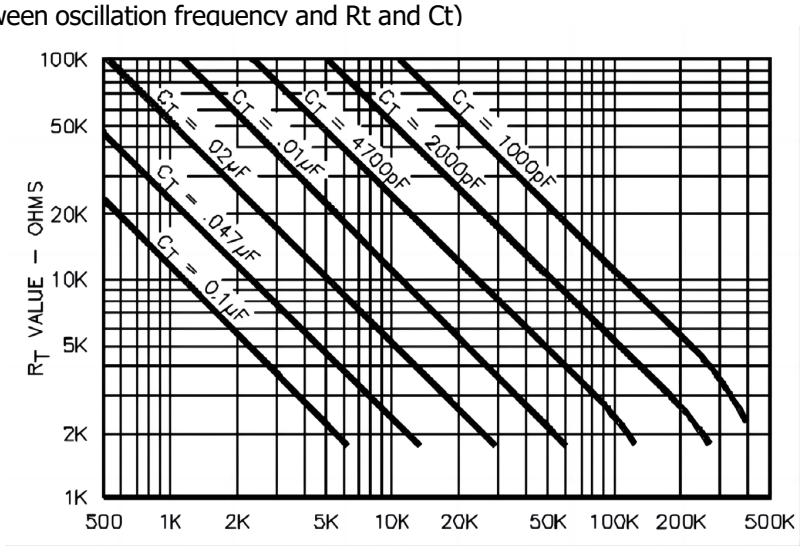
Symbol	Parameter	Condition	SG3524			Unit
			MIN.	TYP.	MAX.	
Reference voltage part Vref (without explanation, IL = 0mA)						
Vref	output voltage		4.8	5.0	5.2	V
Line Reg	Voltage linearity	Vin=8V~40V			30	mV
Load Reg	Load linearity	IL = 0 to 20mA			50	mV
Short current	Reference short-circuit current	VREF = 0V	25		150	mA
Oscillator (without explanation FOSC = 40KHz, RT = 2.9KW, CT =0.01uF)						
Fosc	oscillation frequency		36		44	KHz
	Frequency voltage drift	VIN = 8V to 40V			1	%
MaxFosc	maximum frequency of oscillation	RT = 2K, CT = 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
Error amplifier Part EA (without explanation, Vcm=2.5V)						
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	VPIN 1 - VPIN 2 > 150mV		0.2	0.5	V
Voh	Output high level	VPIN 2 - VPIN 1 > 150mV	3.8	4.2		V
CMR	Input common mode suppression	VCM = 1.8V to 3.4V	70			dB
PWM comparator section						
Min Duty	Minimum duty cycle	VCOMP = 0.5V			0	%
Max Duty	Maximum duty cycle	VCOMP = 3.6V	45	49		%
Current limiting circuit part Current Limit Amplifier (VCM = 0V)						
Vsense	Input threshold voltage		180		220	mV
Ib	input bias current				200	uA
Circuit off part Shutdown						
Vth	The threshold voltage is turned off		0.5	0.8	1.2	V
Output part (per output)						
Cleak	Collector leakage current	VCE = 40V			50	uA
Vcsat	Collector pressure drop	IC = 50mA			2	V

Character	Test ondition	Symbol	Parameter value			Unit
			MIN.	TYP.	MAX.	
Initiation control						
Low current input	V (pin3) =0.4V	ISTL		-25	-200	μA
High current input	V (pin13) =2.4V	ISTH		25	200	μA
	V (pin13) =Vref			75		
Integral part						
Standby current (pin 6 is reference voltage, other input and output are open)	Vcc=15V	Icc		6	10	mA
	Vcc=40V			9	15	
Average power current (see 2 for test circuit diagram)	Vcc=15V; RT=12kΩ; CT=0.01μF; V (pin14) =2.0V			7.5		mA

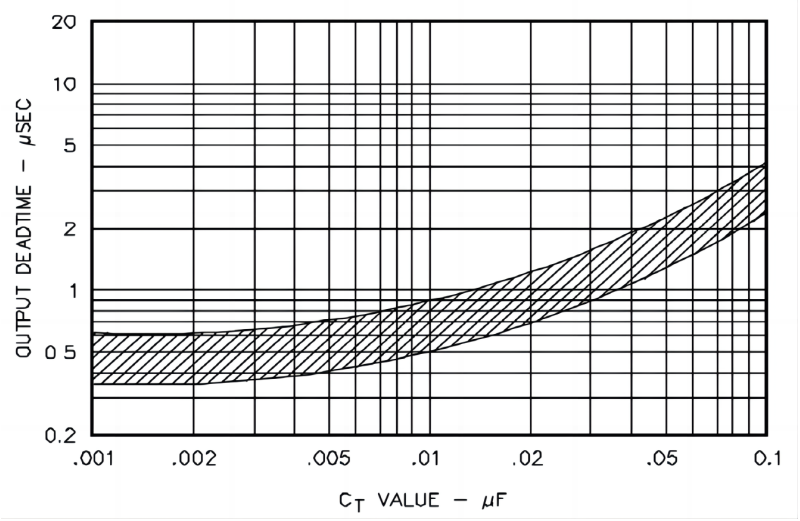
Symbol	Parameter	Ondition	Parameter value			Unit
			MIN.	TYP.	MAX.	
Ve	Emitter output voltage	IE = 50mA	17			V
Rise time	Collector output rise time	RC = 2K			0.4	us
Fall time	Collector output drop time	RC = 2K			0.2	us
Circuit whole						
Icc	Static working current	VIN = 40V			10	mA

Applications and notes

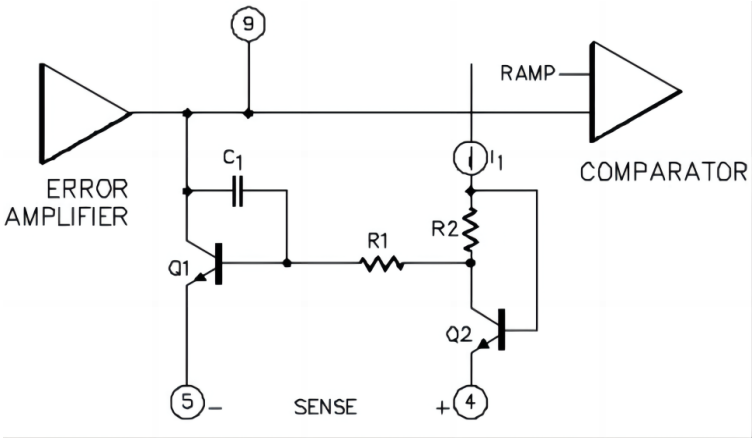
1. Table 1(Relation between oscillation frequency and Rt and Ct)



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

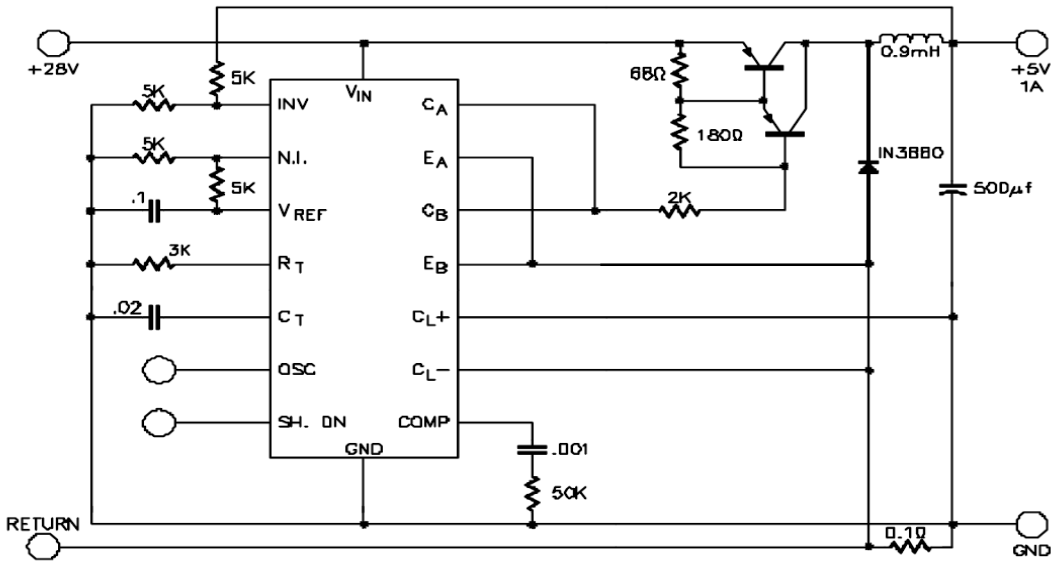


3. Internal current limiting circuit diagram

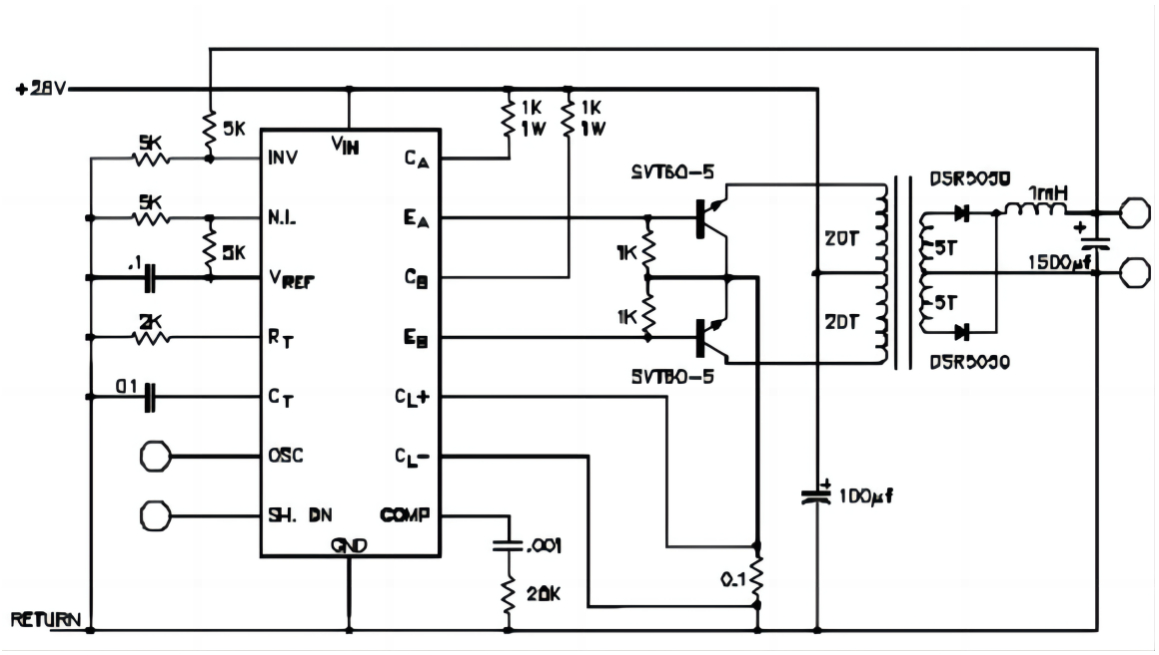


C.L. Threshold $= V_{BE}(Q1) + I_1 \cdot R_2 - V_{BE}(Q2) = I_1 \cdot R_2$
~ 200 mV

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



5. Push-pull output application



Package dimensions and outline drawings

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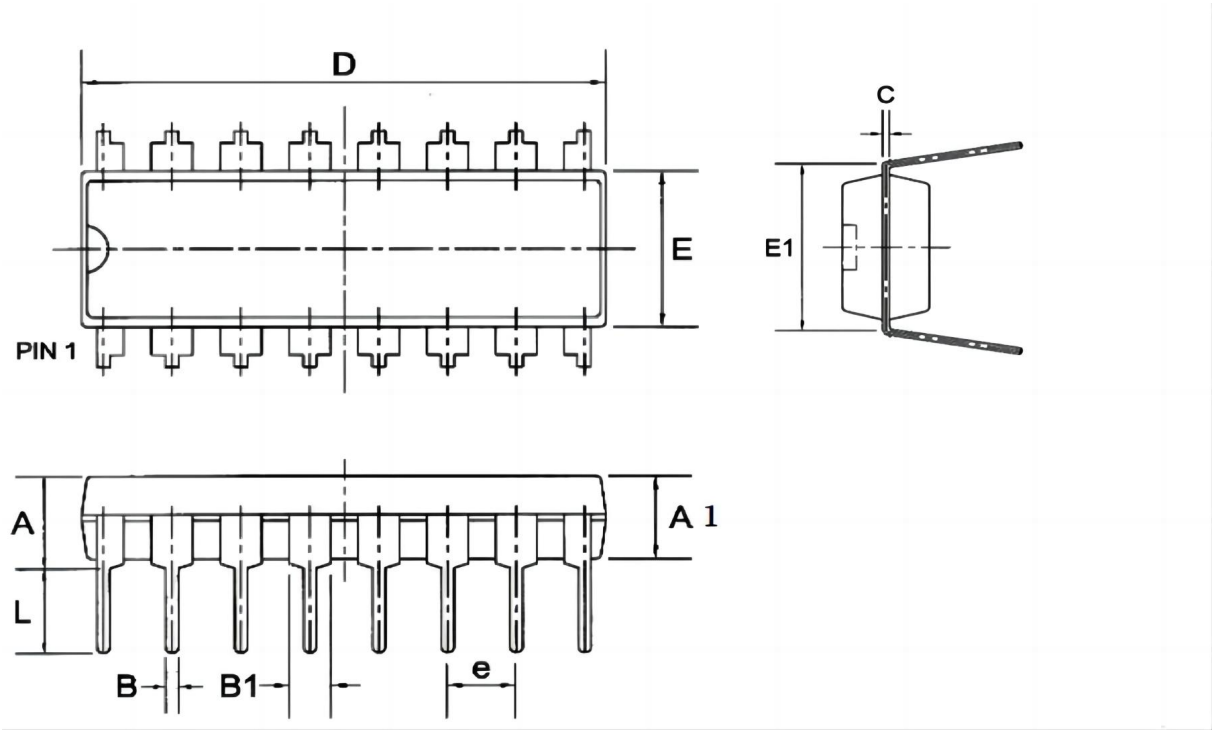

Symbol	Dimensions in Millimeters		
	Min	Nom	Max
A	--	--	4.31
A1	3.15	3.30	3.65
B	--	0.50	--
B1	--	1.6	--
C	--	0.27	--
D	19.00	19.20	19.60
E	6.20	6.50	6.60
E1	--	8.0	--
e	--	2.3	--
L	3.00	3.20	3.60

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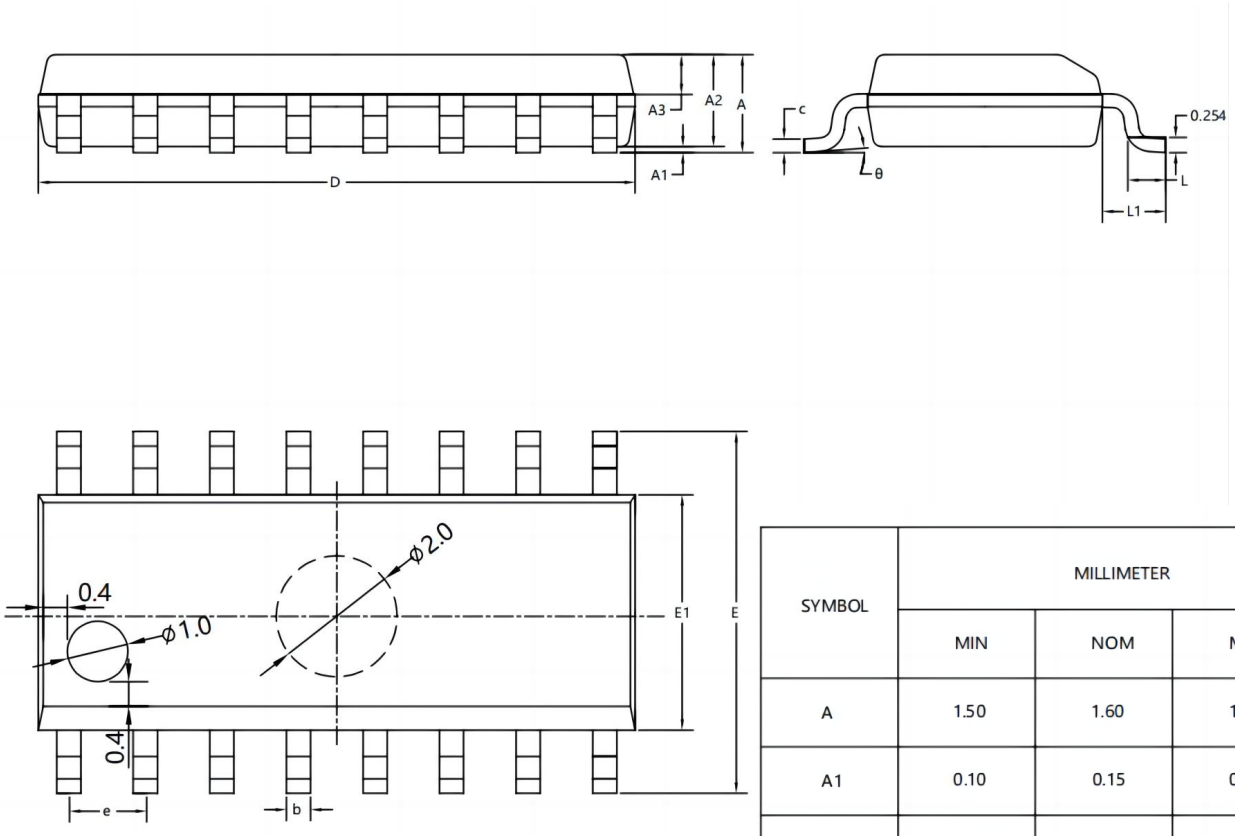

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.50	1.60	1.70
A1	0.10	0.15	0.25
A2	1.40	1.45	1.50
A3	0.60	0.65	0.70
b	0.30	0.40	0.50
c	0.15	0.20	0.25
D	9.80	9.90	10.00
E	5.80	6.00	6.20
E1	3.85	3.90	3.95
e	1.27BSC		
L	0.50	0.60	0.70
L1	1.05BSC		
θ	0°	4°	8°

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