



Descriptions

The SG3524DR 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.

SG3524DR 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

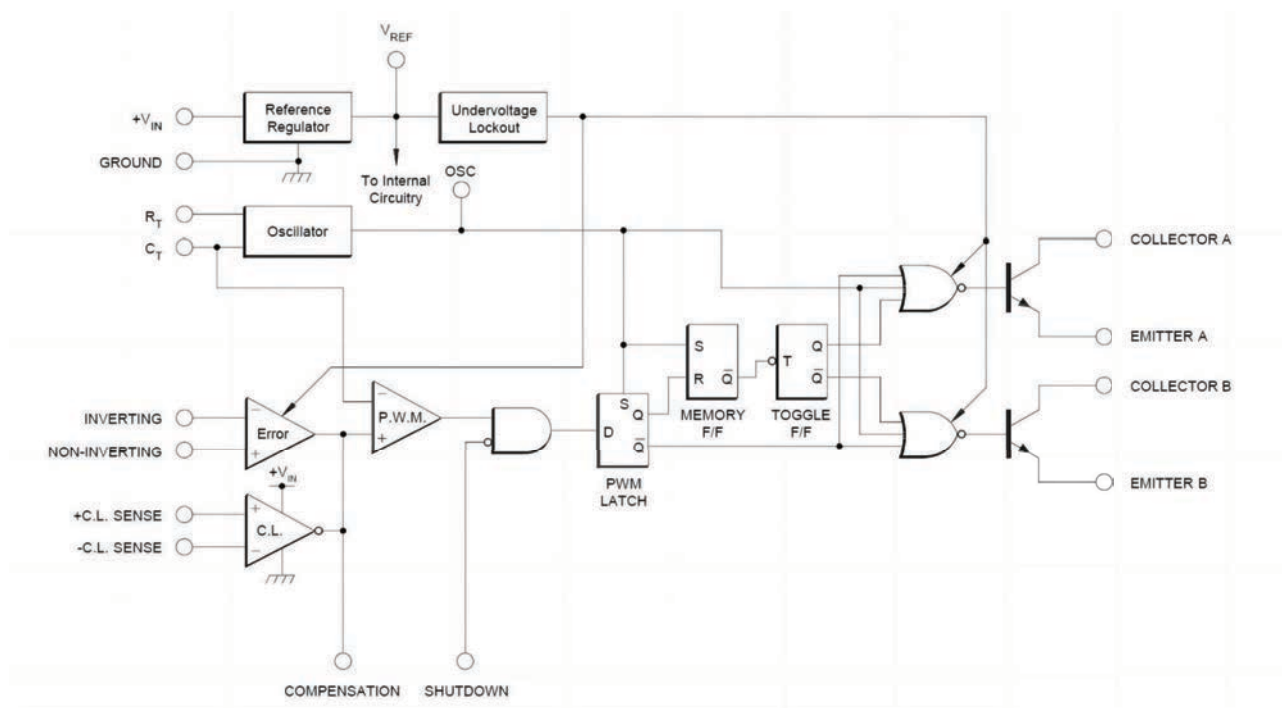
- Transformer coupled DC/DC converter
- Switching regulator with arbitrary polarity

Ordering Information

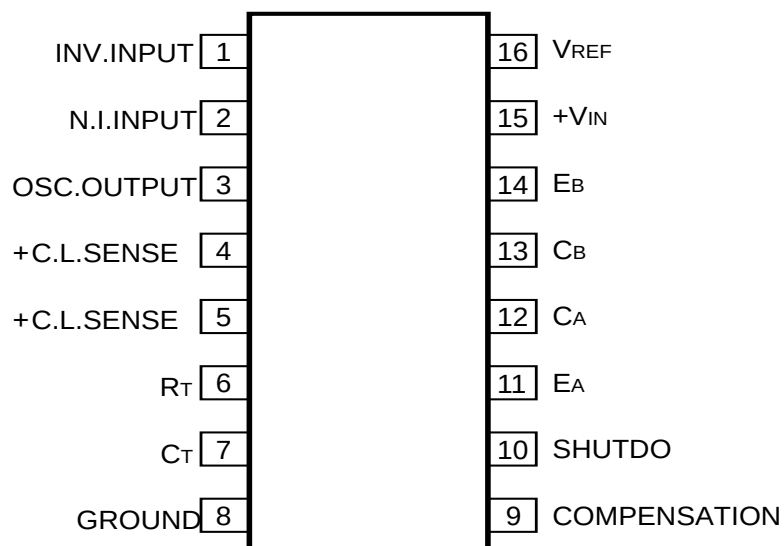
Product Model	Package Type	Packing	Packing Qty
SG3524DR	SOP-16(SOIC-16)	Tape	2500Pcs/Reel



Functional block diagram



Pin Diagram





Absolute Maximum Ratings

(If no other provisions, Tamb=25°C)

Parameter	Value	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	°C
operating ambient temperature	0~70	°C

Recommended working conditions

Parameter	Value	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	°C
operating ambient temperature	0~70	°C



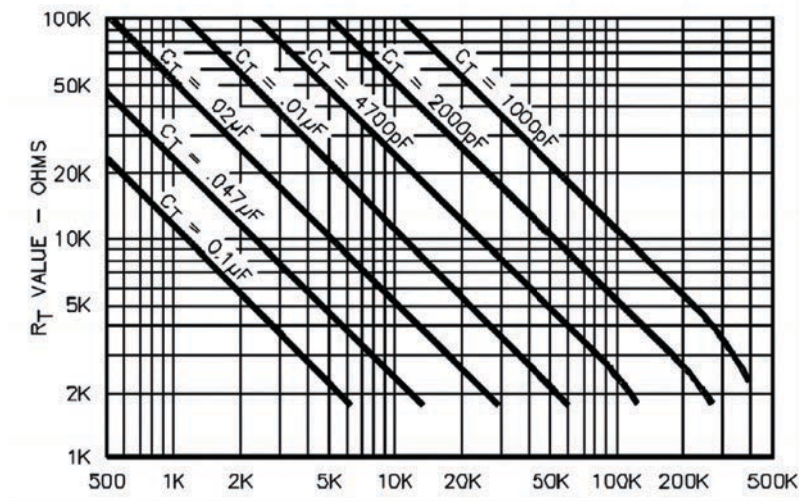
Electric parameter

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

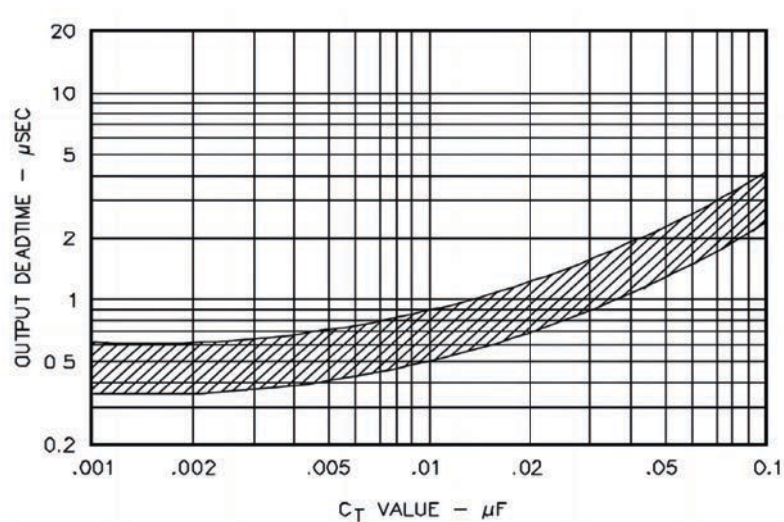
Symbol	Parameter	Condition	SG3524DR			Unit
			Min.	Typ.	Max.	
Vref	Output Voltage		4.8	5.0	5.2	V
Line Reg	Voltage linearity	$V_{in}=8V\sim 40V$			30	mV
Load Reg	Load linearity	$I_L = 0$ to 20mA			50	mV
Short current	Reference short-circuit current	$V_{REF} = 0V$	25		150	mA
Fosc	Oscillation Frequency		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

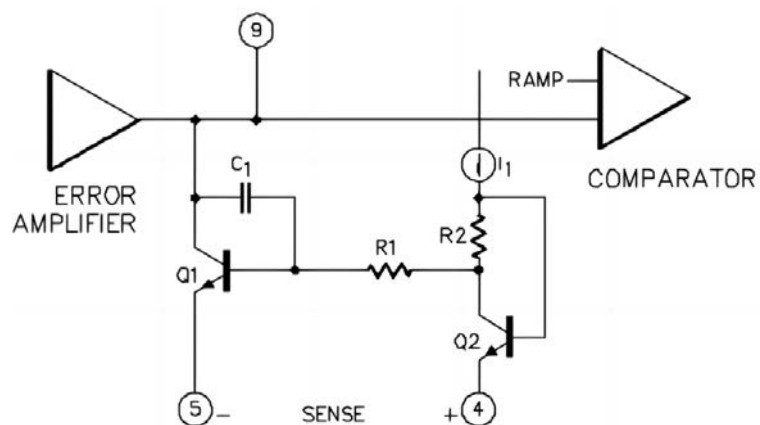
1. Table 1(Relation between oscillation frequency and Rt and Ct)



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



3. Internal current limiting circuit diagram

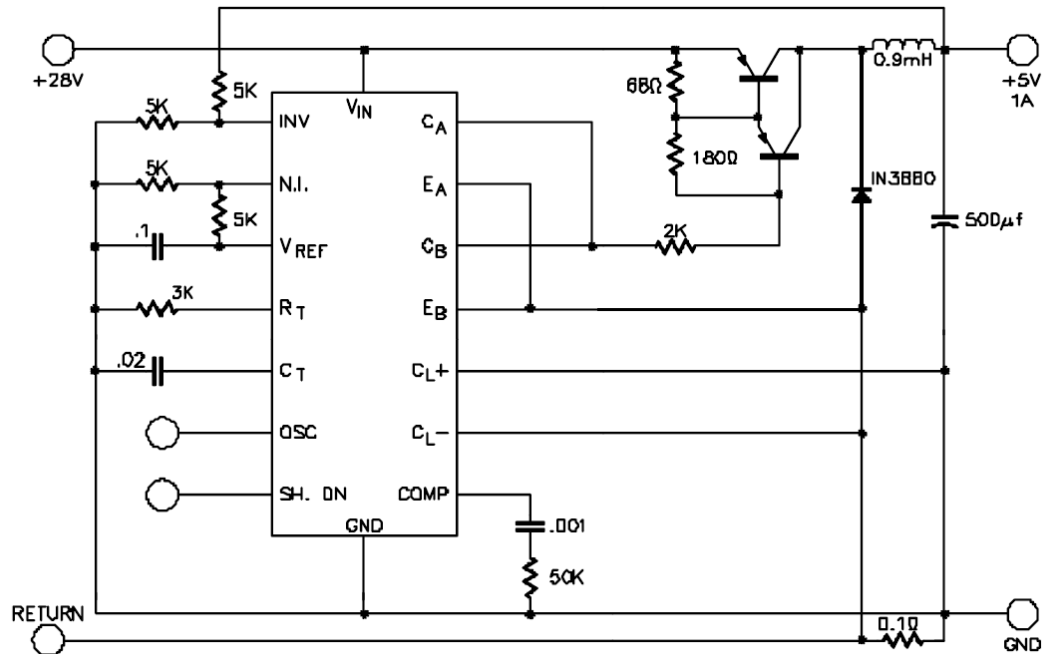


$$\text{C.L. Threshold} = V_{BE}(Q1) + I_1 \cdot R_2 - V_{BE}(Q2) = I_1 \cdot R_2$$

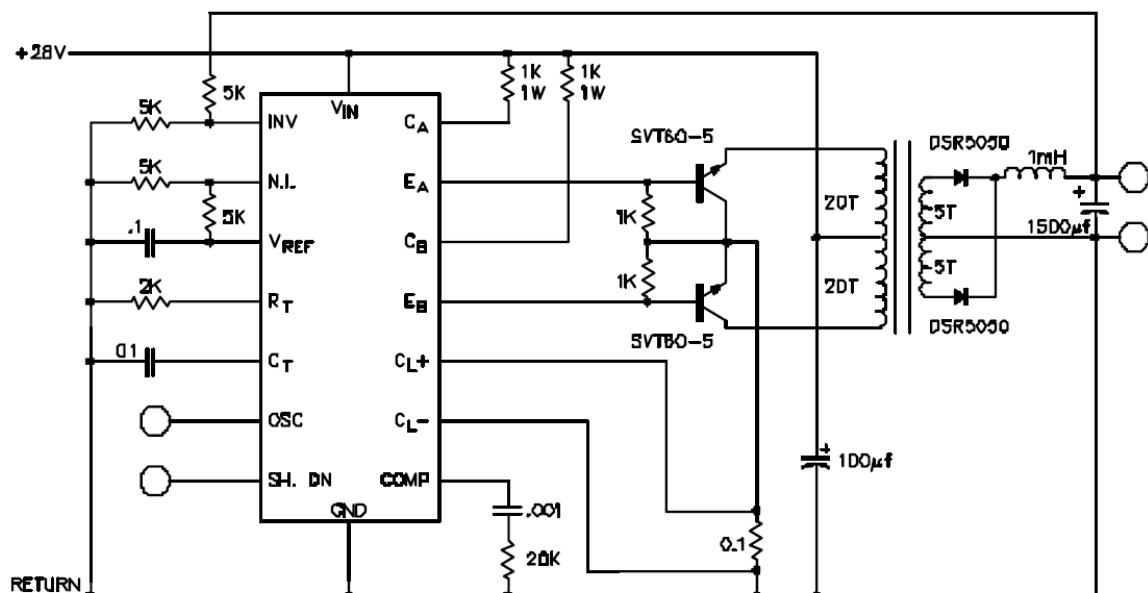
$$\sim 200 \text{ mV}$$



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



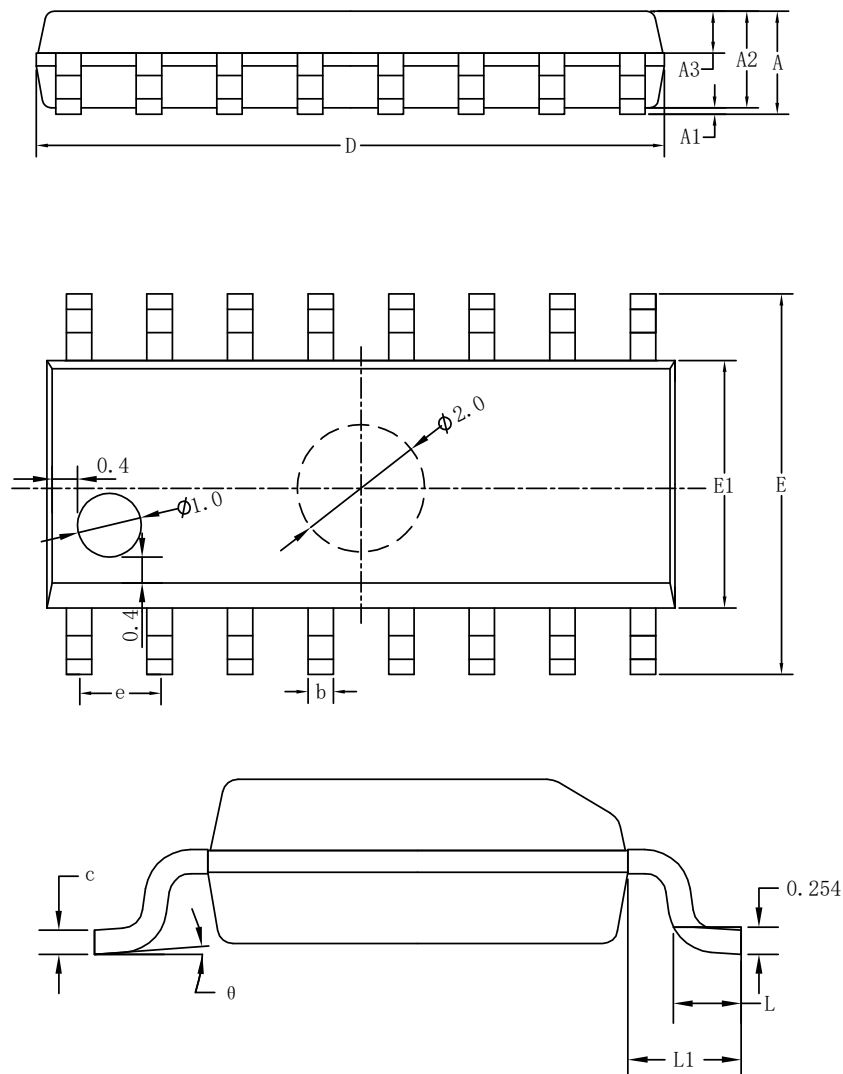
5. Push-pull output application





Package Information

SOP-16(SOIC-16)



Size Symbol	Dimensions In Millimeters			Size Symbol	Dimensions In Inches		
	Min(mm)	Nom(mm)	Max(mm)		Min(in)	Nom(in)	Max(in)
A	1.500	1.600	1.700	A	0.059	0.063	0.067
A1	0.100	0.150	0.250	A1	0.004	0.006	0.010
A2	1.400	1.450	1.500	A2	0.055	0.057	0.059
A3	0.600	0.650	0.700	A3	0.024	0.026	0.028
b	0.300	0.400	0.500	b	0.012	0.016	0.020
c	0.150	0.200	0.250	c	0.006	0.008	0.010
D	9.800	9.900	10.00	D	0.386	0.390	0.394
E	5.800	6.000	6.200	E	0.228	0.236	0.244
E1	3.850	3.900	3.950	E1	0.152	0.154	0.156
e	1.27(BSC)			e	0.050(BSC)		
L	0.500	0.600	0.700	L	0.020	0.024	0.028
L1	1.05(BSC)			L1	0.041(BSC)		
θ	0°	4°	8°	θ	0°	4°	8°



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