

2-Channel Switching Regulator Controller

The CP9743 is a 2-channel switching regulator controller that uses a pulse width modulation (PWM) system. Both channels can be used for DC / DC converter operations including step up, step down, and inverting. Because the IC is compactly packaged, it is best suited for use as a power supply in portable equipment.

●Applications

DC / DC converters in VCRs, notebook computers, etc.

●Features

- | | |
|---|--|
| 1) Built-in reference voltage current ($\pm 1\%$). | 4) Built-in reference voltage (2.505V) output pin. |
| 2) Timer latch, short-circuit protection circuit is built in. | 5) Rest period is adjustable over the whole range of duty ratio. |
| 3) Circuit to prevent malfunction during low input voltage is built in. | |

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	36	V
Power dissipation	P _d	450*1	mW
Operating temperature	T _{opr}	-40~+85	°C
Storage temperature	T _{stg}	-55~+125	°C
Output pin current	I _o	120*2	mA
Output pin voltage	V _o	36	V

*1 Reduced by 4.5 mW for each increase in Ta of 1°C over 25°C
(when mounted on a board 50.0×50.0×1.6 mm).

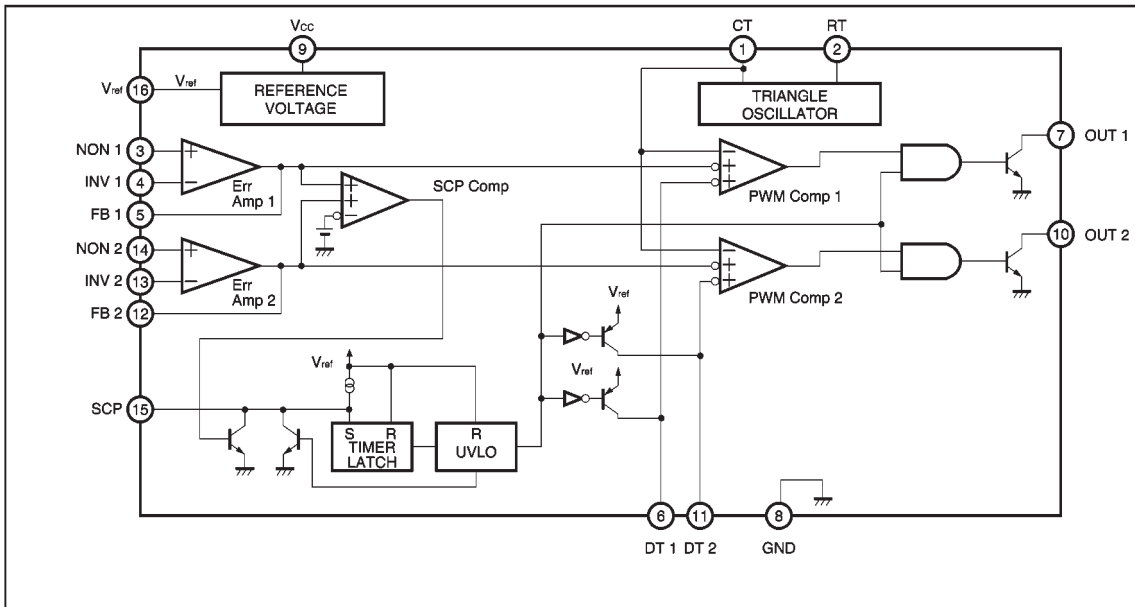
*2 Should not exceed Pd- or ASO-value.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V _{CC}	3.6	6.0	35	V
Output pin current	I _o	—	—	100	mA
Output pin voltage	V _o	—	—	35	V
Error amplifier input voltage	V _{OM}	0.3	—	1.6	V
Timing capacitance	C _{CT}	100	—	15000	pF
Timing resistance	R _{RT}	5.1	—	50	kΩ
Oscillation frequency	F _{osc}	10	—	800	kHz

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Pin No.	Pin name	Function
1	CT	External timing capacitance
2	RT	External timing resistance
3	NON1	Positive input for error amplifier 1
4	INV1	Negative input for error amplifier 1
5	FB1	Output for error amplifier 1
6	DT1	Output 1 dead time / soft start setting
7	OUT1	Output 1
8	GND	Ground
9	V _{cc}	Power supply
10	OUT2	Output 2
11	DT2	Output 2 dead time / soft start setting
12	FB2	Output for error amplifier 2
13	INV2	Negative input for error amplifier 2
14	NON2	Positive input for error amplifier 2
15	SCP	Timer latch setting
16	V _{ref}	Reference voltage (2.505 V) output

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Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
〈Reference voltage section〉						
Output voltage	V _{ref}	2.48	2.505	2.53	V	I _{ref} =1mA
Input stability	V _{DLI}	—	1	10	mV	V _{CC} =3.6~35V
Load stability	V _{DLO}	—	1	10	mV	I _{ref} =0~5mA
〈Triangular wave oscillator section〉						
Oscillation frequency	F _{OSC}	320	400	480	kHz	R _{RT} =10kΩ, C _{CT} =220pF
Frequency variation	F _{DV}	—	1	—	%	V _{CC} =3.6~35V
〈Protection circuit section〉						
Threshold voltage	V _{IT}	1.48	1.64	1.80	V	
Standby voltage	V _{STB}	—	50	100	mV	No pull-up
Latch voltage	V _{LT}	—	30	100	mV	No pull-up
Source current	I _{SCP}	1.5	2.5	3.5	μA	
Comparator threshold voltage	V _{CT}	0.95	1.05	1.15	V	5pin, 12pin
〈Rest period adjustment circuit section〉						
Input threshold voltage (f _{osc} =10kHz)	V _{IO}	1.87	1.97	2.07	V	Duty cycle=0%
	V _{I100}	1.38	1.48	1.58	V	Duty cycle=100%
ON duty cycle	D _{ON}	45	55	65	%	V _{ref} is divided by 13k and 27kΩ resistors
Input bias current	I _{BDT}	—	0.1	1	μA	DT1, DT2=2.0V
Latch mode source current	I _{DT}	200	560	—	μA	DT1, DT2=0V
Latch input voltage	V _{DT}	2.28	2.48	—	V	I _{DT} =40μA
〈Low-input malfunction prevention circuit section〉						
Threshold voltage	V _{UT}	2.23	2.53	2.83	V	
〈Error amplifier section〉						
Input offset voltage	V _{IO}	—	—	6	mV	
Input offset current	I _{IO}	—	—	30	nA	
Input bias current	I _{IB}	—	15	100	nA	
Open loop gain	A _V	70	85	—	dB	
Common-mode input voltage	V _{OM}	0.3	—	1.6	V	V _{CC} =3.6~35V
Common-mode rejection ratio	CMRR	60	80	—	dB	
Maximum output voltage	V _{OH}	2.3	2.5	—	V	
Minimum output voltage	V _{OL}	—	0.7	0.9	V	
Output sink current	I _{OI}	3	20	—	mA	FB=1.25V
Output source current	I _{OO}	45	75	—	μA	FB=1.25V
〈PWM comparator section〉						
Input threshold voltage (f _{osc} =10kHz)	V _{IO}	1.87	1.97	2.07	V	Duty cycle=0%
	V _{I100}	1.38	1.48	1.58	V	Duty cycle=100%
〈Output section〉						
Saturation voltage	V _{SAT}	—	0.8	1.2	V	I _O =75mA
Leakage current	I _{REAK}	—	—	5	μA	V _O =35V
〈Total device〉						
Standby current	I _{CCS}	—	1.3	1.8	mA	When output is OFF
Average current dissipation	I _{CCA}	—	1.6	2.3	mA	R _{RT} =10kΩ

©Not designed for radiation resistance.

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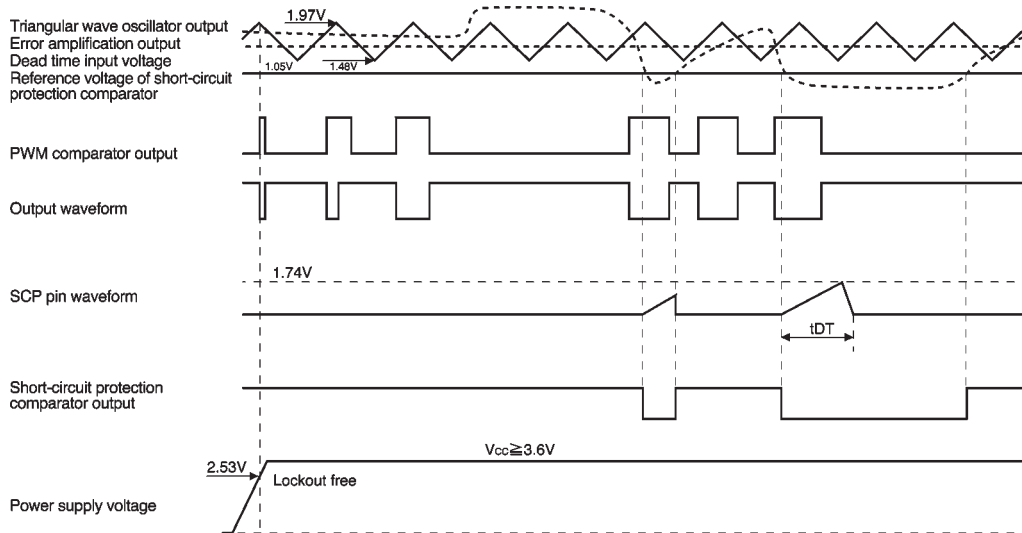


Fig.1

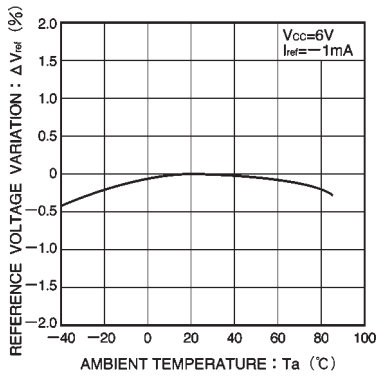


Fig.2 Reference voltage variation vs. ambient temperature

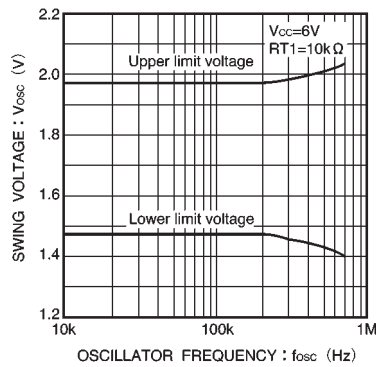


Fig.3 Swing voltage vs. oscillation frequency

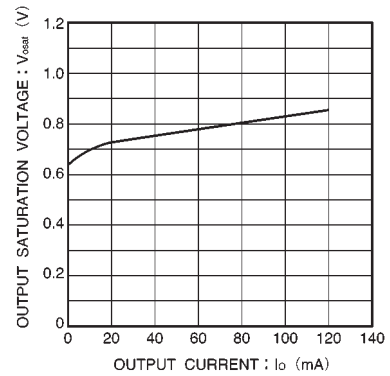


Fig.4 Output saturation voltage vs. output current

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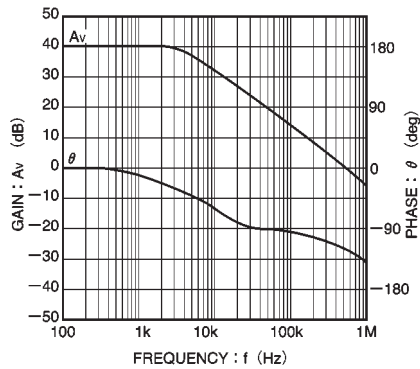
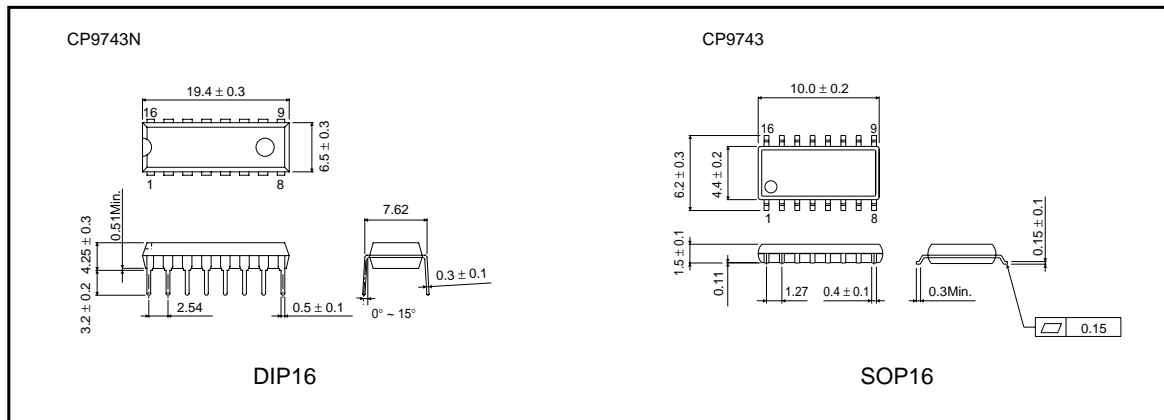


Fig.5 Gain and phase plotted against frequency for the error amplifier (40dB close)

● External dimensions (Units: mm)



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