

UTC BA9741 LINEAR INTEGRATED CIRCUIT

TWO-CHANNEL SWITCHING REGULATOR CONTROLLER

DESCRIPTION

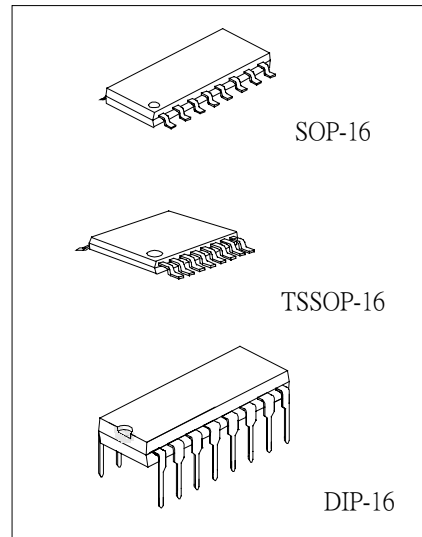
The UTC BA9741 is a two-channel switching regulator controllers that use the PWM method. It can be used for DC to DC conversion for step-up, step-down, and inverting. The IC comes in a compact package, making it ideal for use in portable equipment.

FEATURES

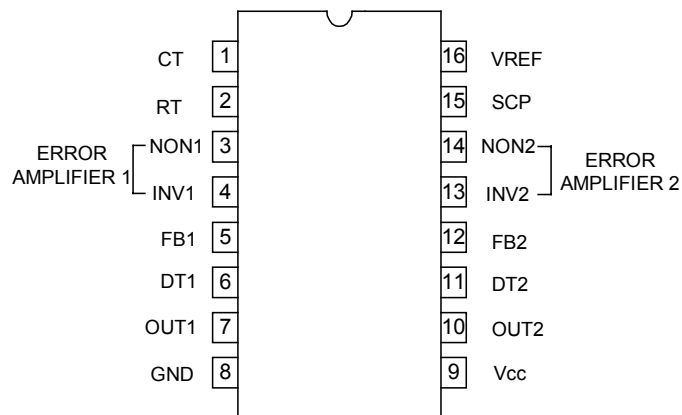
- *High-accuracy reference voltage circuit ($\pm 1\%$).
- *Time-latch, short-circuit protection circuit.
- *Miss-operation prevention circuit for low-voltage input
- *Reference voltage with output (2.5V)
- *Rest period adjustment is possible over the entire duty range.

APPLICATION

*DC/DC converters for video cameras and notebook computers etc.



PIN CONFIGURATIONS

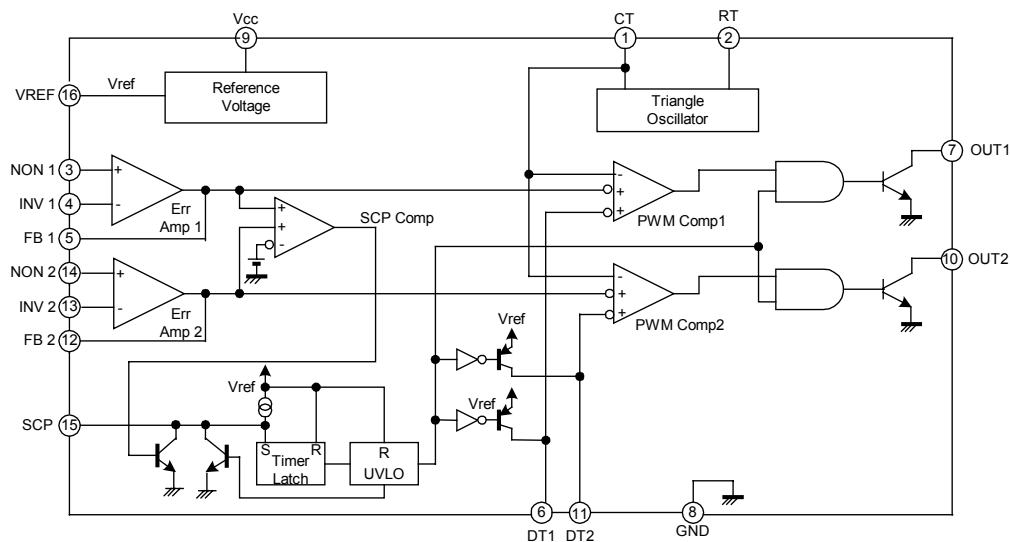


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PIN DESCRIPTIONS

PIN NO.	PIN NAME	FUNCTION
1	CT	External timing capacitor
2	RT	External timing resistor
3	NON1	Positive input for error amplifier 1
4	INV1	Negative input for error amplifier 1
5	FB1	Error amplifier 1 output
6	DT1	Output 1 dead time/soft start setting
7	OUT1	Output 1
8	GND	Ground
9	Vcc	Power supply
10	OUT2	Output 2
11	DT2	Output 2 dead time / soft start setting
12	FB2	Error amplifier 2 output
13	INV2	Negative input for error amplifier 2
14	NON2	Positive input for error amplifier 2
15	SCP	Time latch setting
16	VREF	Reference voltage output (2.5V)

BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Power Supply Voltage	V _{cc}	36	V
Power Dissipation (note 1) SOP-16 DIP-16	P _d	500 650	mW
Operating Temperature	T _{opr}	-40 to 85	°C
Storage Temperature	T _{stg}	-55 to 125	°C
Output Current	I _o	120(note 2)	mA
Output Voltage	V _o	36	V

Note 1: When mounted on 70mm*70mm*1.6mm glass epoxy board.

Reduced by 5.0mW,for each increase in Ta of 1°C over 25°C

Note 2: Should not exceed P_d and ASO values.

RECOMMENDED OPERATING CONDITIONS(Ta=25°C)

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNIT
Power Supply Voltage	V _{cc}	3.6	6.0	35	V
Output Current	I _o			100	mA
Output Voltage	V _o			35	V
Error Amplifier Input Voltage	V _{OM}	0.3		1.6	V
Timing Capacitor	C _{CT}	100		15000	pF
Timing Resistor	R _{RT}	5.1		50	kΩ
Oscillator Frequency	F _{OSC}	10		800	kHz

ELECTRICAL CHARACTERISTICS(TA=25°C ,V_{cc}=6V,UNLESS OTHERWISE NOTED.)

PARAMETER	SYMBOL	TEST CONIDITIONS	MIN	TYP.	MAX	UNIT
REFERENCE VOLTAGE BLOCK						
Output Voltage	V _{ref}	I _{ref} =1mA	2.4	2.5	2.6	V
Input Stability	V _{DLI}	V _{cc} =3.6~35V		1	10	mV
Load Stability	V _{DLO}	I _{ref} =0~5mA		1	10	mV
TRIANGULAR WAVE OSCILLATOR						
Oscillation Frequency	F _{osc}	R _{RT} =10 kΩ ,C _{CT} =220pF	320	400	480	kHz
Frequency Deviation	F _{DV}	V _{cc} =3.6~35V		1		%
PROTECTION CIRCUIT						
Threshold Voltage	V _{IT}		1.48	1.64	1.80	V
Standby Voltage	V _{STB}	No pull up		50	100	mV
Latch Voltage	V _{LT}	No pull up		30	100	mV
Source Current	I _{SCP}		1.5	2.5	3.5	μA
Comparator Threshold Voltage	V _{CT}	5Pin,12Pin	0.9	1.05	1.2	V
REST PERIOD ADJUSTMENT CIRCUIT						
Input Threshold Voltage (fosc=10kHz)	V _{t0}	Duty Cycle =0%	1.79	1.97	2.15	V
	V _{t100}	Duty Cycle =100%	1.32	1.48	1.64	V

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PARAMETER	SYMBOL	TEST CONIDITIONS	MIN	TYP.	MAX	UNIT
On Duty Cycle	DON	Divide Vref using 13 k Ω and 27 k Ω	45	55	65	%
Input Bias Current	I _{BDT}	DT1,DT2=2.0V		0.1	1	μ A
Latch Mode Source Current	I _{DT}	DT1,DT2=0V	200	560		μ A
Latch Input Voltage	V _{DT}	I _{DT} =40 μ A	2.28	2.48		V
LOW-VOLTAGE INPUT MISS-OPERATION PREVENTION CIRCUIT						
Threshold Voltage	V _{UT}			2.53		V
ERROR AMPLIFIER						
Input Offset Voltage	V _{IO}				6	mV
Input Offset Current	I _{IO}				30	nA
Input Bias Current	I _{IB}			15	100	nA
Open Circuit Gain	A _V		70	85		dB
Common-mode Input Voltage range	V _{OM}	V _{CC} =3.6~35V	0.3		1.6	V
Common-mode Rejection Ratio	CMRR		60	80		dB
Maximum Output Voltage	V _{OH}		2.3	2.5		V
Minimum Input Voltage	V _{OL}			0.7	0.9	V
Output Sink Current	I _{OI}	FB=1.25V	3	20		mA
Output Source Current	I _{OO}	FB=1.25V	45	75		μ A
PWM COMPARATOR						
Input Threshold Voltage (f _{osc} =10kHz)	V _{I0}	Duty Cycle =0%	1.79	1.97	2.15	V
	V _{I100}	Duty Cycle =100%	1.32	1.48	1.64	V
OUTPUT BLOCK						
Saturation Voltage	V _{SAT}	I _O =75mA		0.8	1.2	V
Leak Current	I _{REAK}	V _O =35V		0	5	μ A
TOTAL DEVICE						
Standby Current	I _{CCS}	When output is off		1.3	1.8	mA
Average Current Consumption	I _{CCA}	R _{RT} =10 k Ω		1.6	2.3	mA

TIMING CHART

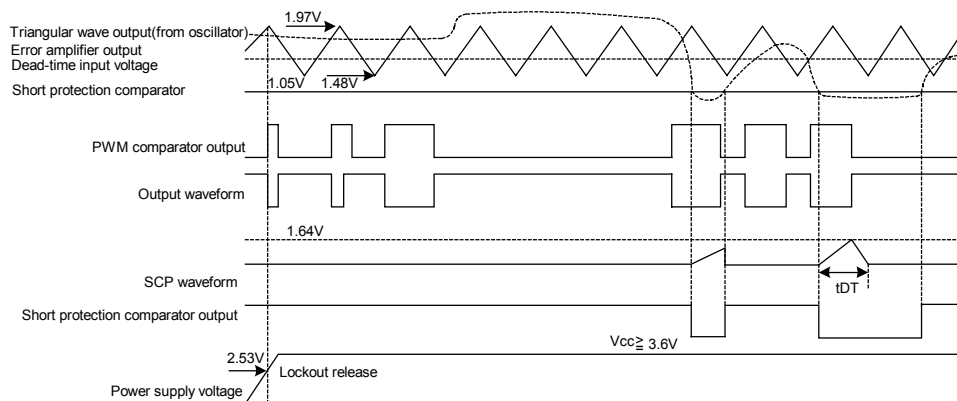
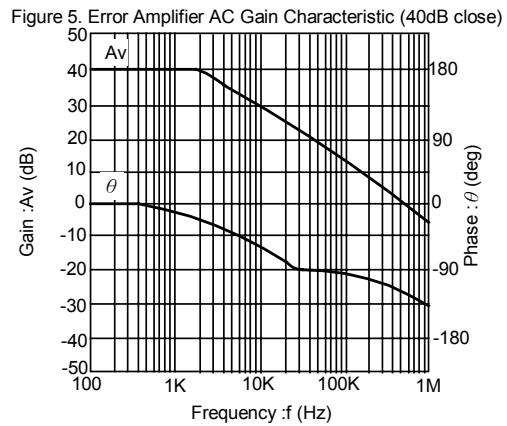
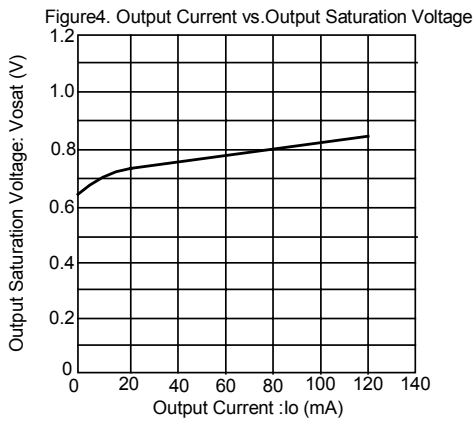
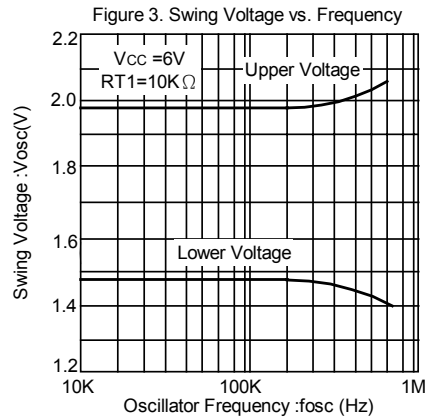
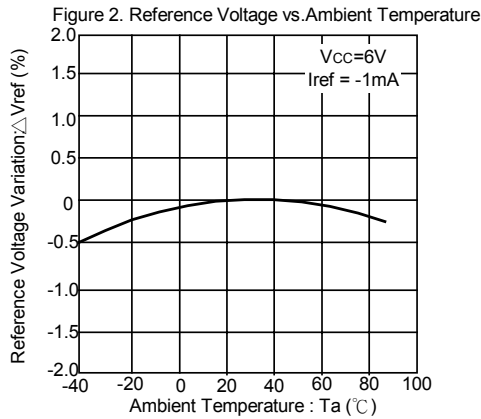


Figure. 1

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ELECTRICAL CHARACTERISTIC CURVES



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