



U9751B

LINEAR INTEGRATED CIRCUIT

DOUBLE CHANNELS PWM CONTROLLER

DESCRIPTION

The UTC **U9751B** consists of two PWM control circuits. Two PWM controllers is independent each other. It is low cost in many applications.

FEATURES

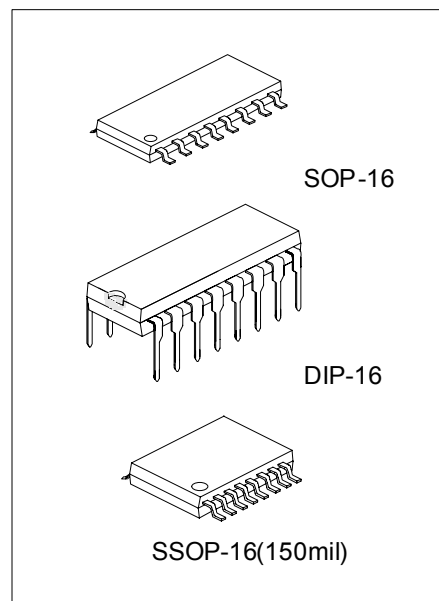
- * Switch frequency: 400KHz
- * $I_{SINK} = 400mA$
- * Wide work voltage
- * Programmable dead-time control
- * UVLO protection
- * SCP protection
- * Lower static supply current

APPLICATION

- * DC/DC converters for video cameras、backlight inverter and notebook computers etc.

ORDER INFORMATION

Order Number		Package	Packing
Normal	Lead Free Plating		
U9751B-D16-T	U9751BL-D16-T	DIP-16	Tube
U9751B-S16-R	U9751BL-S16-R	SOP-16	Tape Reel
U9751B-S16-T	U9751BL-S16-T	SOP-16	Tube
U9751B-R16-R	U9751BL-R16-R	SSOP-16	Tape Reel
U9751B-R16-T	U9751BL-R16-T	SSOP-16	Tube



*Pb-free plating product number: U9751BL

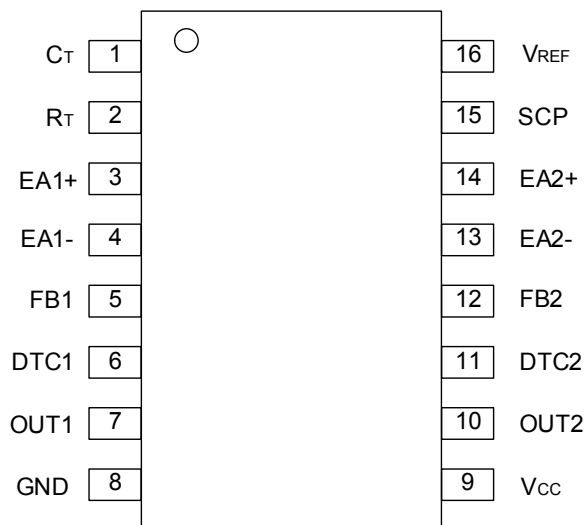
U9751BL-D16-R



- (1)Packing Type
- (2)Package Type
- (3)Lead Plating

- (1) R: Tape Reel, T: Tube
- (2) D16: DIP-16, S16: SOP-16, R16: SSOP-16
- (3) L: Lead Free Plating, Blank: Pb/Sn

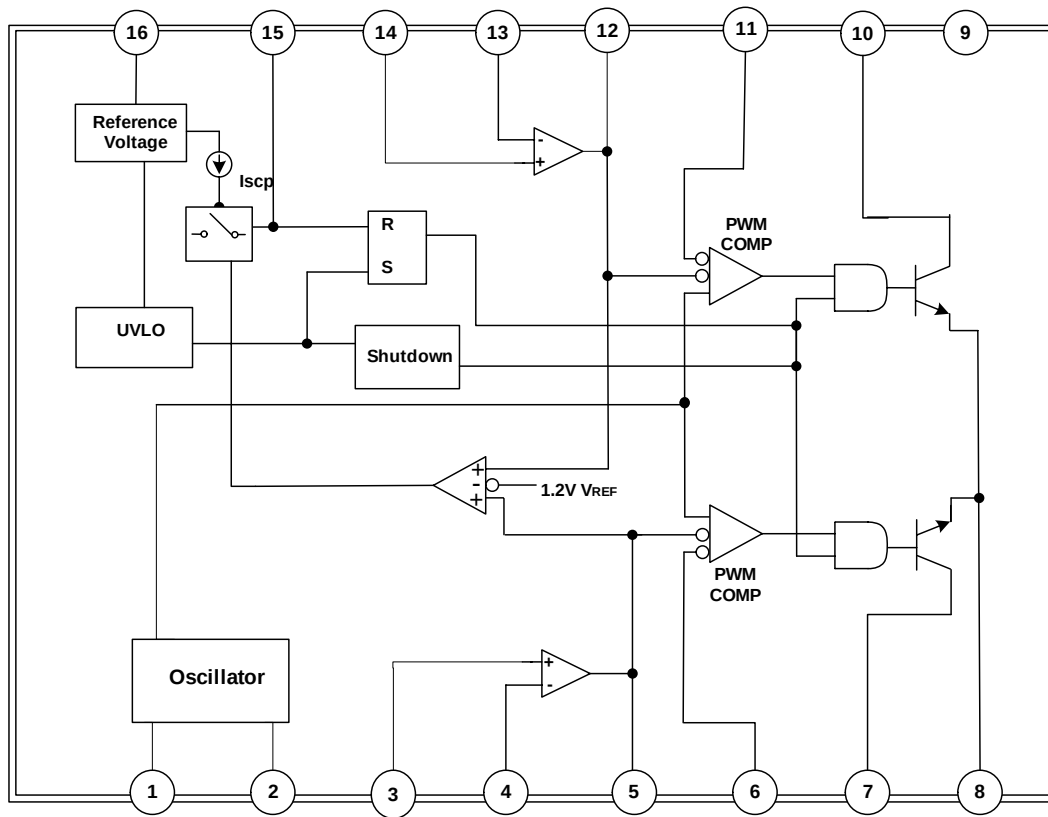
■ PIN CONFIGURATION



■ PIN DESCRIPTION

NO.	NAME	DESCRIPTION
1	C _T	Capacitor connected to the pin controlling Oscillator frequency
2	R _T	Resistor connected to the pin controlling Oscillator frequency
3	EA1+	Error Amplifier 1 positive Input
4	EA1-	Error Amplifier 1 Inverting Input
5	FB1	Error Amplifier 1 Output, used for feedback output 1
6	DTC1	Dead-Time Comparator Output 1
7	OUT1	Output 1
8	GND	Ground
9	V _{CC}	Power Supply
10	OUT2	Output 2
11	DTC2	Dead-Time Comparator Output 2
12	FB2	Error Amplifier 2 Output, used for feedback output 2
13	EA2-	Error Amplifier 2 Inverting Input
14	EA2+	Error Amplifier 2 positive Input
15	SCP	Short Circuit Protection Input
16	V _{REF}	Internal 2.5V Reference Voltage

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	+38	V
Differential Input Voltage	$V_{I(DIFF)}$	+20	V
Output Voltage	V_{OUT}	+38	V
Output Current	I_{OUT}	+450	mA
Maximum Junction Temperature	T_J	+150	°C
Operating Temperature	T_{OPR}	-20 ~ +85	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ DC ELECTRONIC CHARACTERISTICS

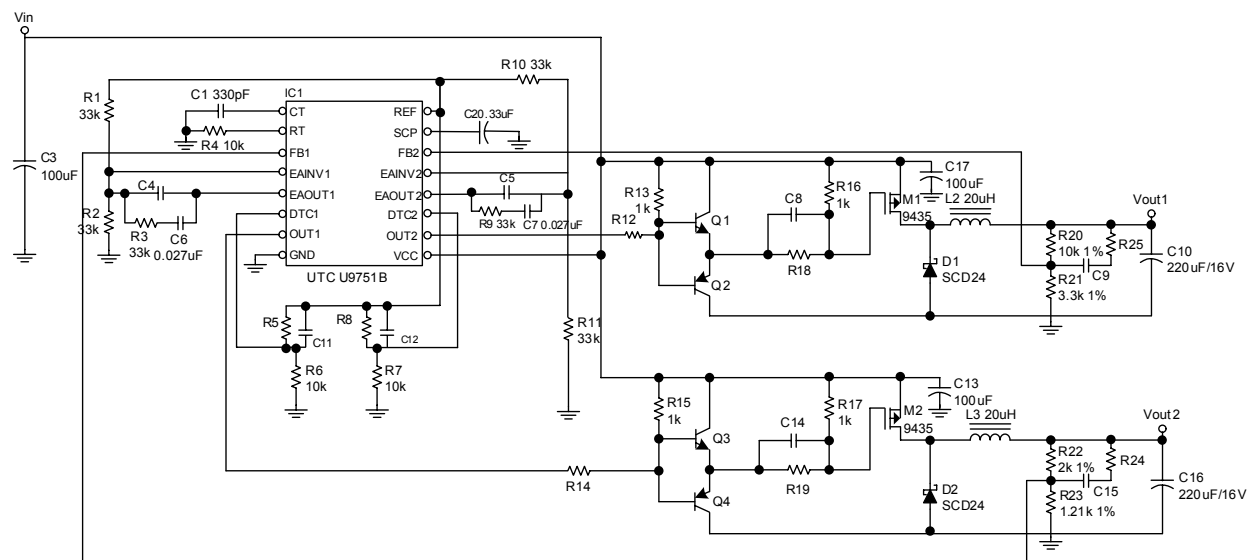
$V_{CC}=6V$, $f=200kHz$ (unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Reference section						
Internal Reference Voltage	V _{REF}	I _{OUT} =1mA	2.40	2.46	2.53	V
V _{REF} Regulation with V _{CC}	△V _{REF}	V _{CC} =3.6V ~ 40V		3.5		mV
V _{REF} Regulation with I _{O(REF)}	△V _{REF}	I _{OUT} = 0.1mA to 1mA		2		mV
V _{REF} Regulation with Temperature		T _A =-20℃~ 25℃		-0.1%	±1%	
		T _A =25℃ ~ 85℃		-0.2%	±1%	
Short-Circuit Output Current	I _{O(SC)}	V _{OUT} =0	18	22	30	mA
Undervoltage Lockout Section						
threshold Voltage(V _{CC})	V _{THR}	I _{O(REF)} = 0.1mA, T _A =25℃	2.5	2.8	3.2	V
Short-Circuit Protection Control Section						
SCP Input Threshold Voltage	V _{I(THR)}	T _A = 25℃	1.2	1.3	1.5	V
SCP Comparator Threshold Voltage	V _{COM(THR)}			1.26		V
SCP Standby Voltage	V _{STN-BY}	No pull-up		110	220	mV
SCP Latched Input voltage	V _{I(LTH)}	No pull-up		77	200	mV
Input (Source) Current	I _{I(SOURCE)}	V _{IN} =0.7V, T _A =25℃	-1.5	-2.0	-2.5	µA
Oscillator Section						
Frequency	f	C _T =220pF, R _T =10K		400		KHz
Deviation of Frequency	△f	C _T =220pF, R _T =10K		10%		
Frequency Regulation with Voltage	△f/△V	V _{CC} =3.6V to 40V		1%		
Frequency Regulation with Temperature	△f/△T	T _A =-20℃ ~ 25℃		-0.4%	±2%	
		T _A =25℃ ~ 85℃		-0.2%	±2%	
Dead-time control section						
Latched Input Voltage	V _{I(LTH)}	I _{OUR (DTC)} =40µA	1.9			V
Input Threshold Voltage at f=10kHz	V _{I(THR)}	Zero duty cycle	1.75	1.95	2.15	V
		Maximum duty cycle	1.3	1.45	1.7	
Input Bias Current	I _{I(BIAS)}			0.2	1	µA
Latch Mode (Source) Current	I _{SOURCE}	T _A =25℃		-620		µA
Error-Amplifier Section						
Input Offset Voltage	V _{I(OFF)}	V _{O(FB)} =1.25V			±6	mV
Common-Mode Input Voltage Range	V _{I(CM)}	V _{CC} =3.6V to 40 V	0.3		1.6	V
Positive Output Voltage Swing	V _{O(POS)}		V _{REF} -0.2			V
Negative Output Voltage Swing	V _{O(NEG)}				1	V
Input Offset Current	I _{I(OFF)}	V _{O(FB)} =1.25V			±100	nA

■ DC ELECTRONIC CHARACTERISTICS(Cont.)

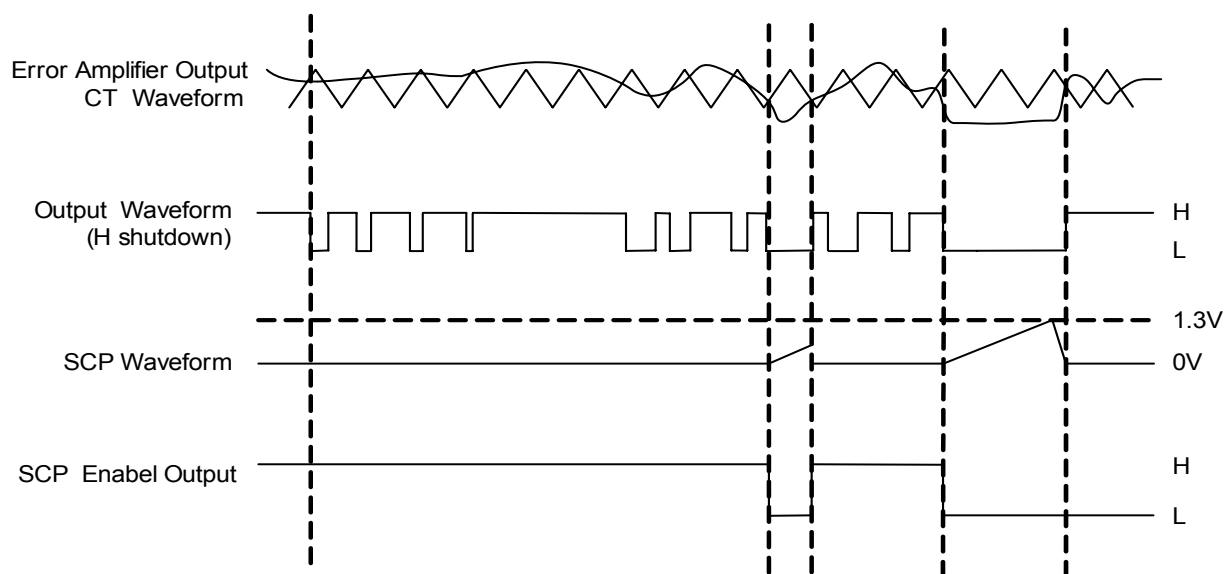
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Bias Current	I _{I(BIAS)}	V _{O(FB)} =1.25V		160	500	nA
Output Sink Current	I _{O(SINK)}	V _{I(DIFF)} =-0.1V,V _{OUT} =1.25V	1	4.0		mA
Output Source Current	I _{O(SOURCE)}	V _{I(DIFF)} =0.1V,V _{OUT} =1.25V	-45	-90		μA
Common-Mode Rejection Ratio	CMRR		60	80		dB
Open-Loop Voltage Gain	G _{VO}	R _F =200KΩ	70	80		dB
Unity-Gain Bandwidth	GB _W			1.5		MHz
Output Section						
Output Saturation Voltage	V _{O(SAT)}	I _{OUT} =10mA		0.7	1	V
Short-Circuit Output Current	I _{O(SC)}	V _{OUT} =6V		450		mA
Off-State Current	I _{O(OFF)}	V _{OUT} =50V			10	μA
PWM Comparator Section						
Input Threshold Voltage at f=10kHz	V _{I(THR)}	Zero duty cycle	1.75	1.95	2.15	V
		Maximum duty cycle	1.3	1.45	1.8	
Total Device						
Standby Supply Current	I _{STN-BY}	Off-state		1.7		mA
Average Supply Current	I _{AVE}	R _T =10K		2.0	2.6	mA

TYPICAL APPLICATION



Typical Application

TIMING WAVEFORM



Timing Diagram

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