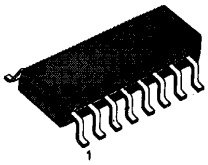
DUAL PWM CONTROLLER

The KA7551 is a dual PWM control circuit designed for power supply control.
This PWM controller includes 2.5V regulator block, two error amplifier blocks, adjustable oscillator block, undervoltage lockout block and common emitter output transistor block. The error amplifier have a common mode voltage range of 1.05V to 1.45V and the dead time control can adjust the duty cycle 0 to 100%.
The oscillator may be operated 1KHz to 500KHz using by C_T and R_T control. During low V_{CC} conditions, the under voltage lockout control circuit can made the outputs off until the internal circuitry start on.

16-SOP



FEATURES

- Dual PWM control circuitry
- Oscillator frequency : 1KHz ~ 500KHz
- Internal under voltage lockout control
- Wide supply voltage range: 3.6V to 40V
- Internal reference voltage: 2.5V

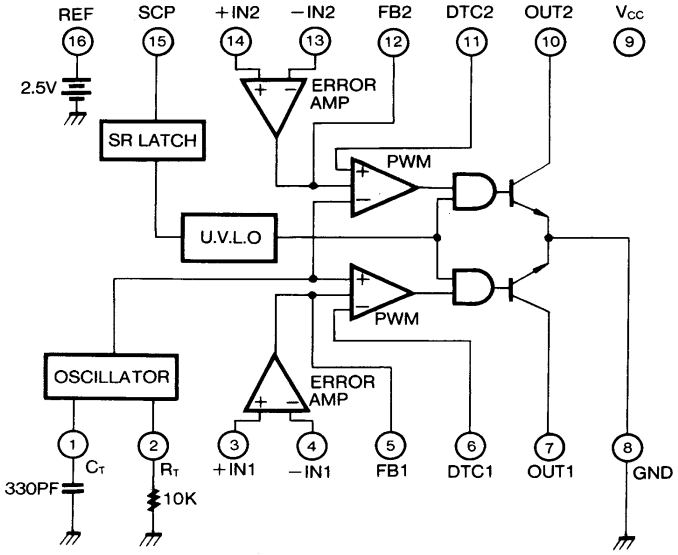
ORDERING INFORMATION

Device	Package	Operating Temperature
KA7551	16 SOP	-25 ~ + 85℃

APPLICATIONS

- DC-DC converter
- Low Power Switching Mode Power Supply

BLOCK DIAGRAM



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ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	41	V
Collector Output Voltage	V_C	51	V
Collector Output Current	I_C	21	mA
Operating Temperature Range	T_{OPR}	- 25 ~ 85	℃
Amplifier Input Voltage	T_{ID}	20	V

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
REFERENCE SECTION						
Output Voltage	V_R	I_O = 1mA	2.4	2.5	2.6	V
Input Regulation	ΔV_O	V_S = 3.6 ~ 40V	-	2.0	12.5	mV
Output Regulation	ΔV_O	I_O = 0.1mA ~ 1mA	-	1.0	7.5	mV
Short Circuit Current	I_S	V_O = 0V	3	10	30	mA
Output Voltage Change	Δ V(I)	T_A = -20 to +25℃	- 1.0	- 0.1	1.0	%
With Temperature	Δ V(II)	T_A = +20 to +85℃	- 1.0	- 0.2	1.0	
UNDER VOLTAGE LOCKOUT SECTION						
Upper Threshold Voltage (pin9)	$V_{TH(U)}$	I_{REF} = 0.1mA	-	2.72	-	V
Lower Threshold Voltage (pin9)	$V_{TH(L)}$	I_{REF} = 0.1mA	-	2.6	-	V
Hysteresis (pin9)	V_{HYS}	I_{REF} = 0.1mA	80	120	-	mV
Reset Threshold Voltage (pin9)	V_{RES}	I_{REF} = 0.1mA	1.5	1.8	-	V
PROTECTION CONTROL SECTION						
Input Threshold Voltage (pin 15)	$V_{TH(I)}$	V5 = V12 = 2.5V	0.65	0.7	0.75	V
Standby Voltage (pin 15)	V_S	V5 = V12 = 2.5V NO PULL UP	140	185	230	mV
Latched Input Voltage (pin 15)	V_{LT}	V5 = V12 = 2.5V NO PULL UP	-	60	120	mV
Input Source Current	I_{SR}	V5 = V12 = 2.5V V_I = 0.7V	10	15	20	uA
Comparator Threshold Voltage (pin 5 and pin 12)	V_{CTH}		-	1.18	-	V

ELECTRICAL CHARACTERISTICS

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
ERROR AMPLIFIER SECTION						
Input Offset Voltage	V_{OS}	V_O = 1.25V	-	-	6.0	mV
Input Bias Current	I_B	V_O = 1.25V	-	160	500	nA
Input Offset Current	I_{OS}	V_O = 1.25V	-	-	100	nA
Common Mode Input Voltage Range	V_{CM}	V_{CC} = 3.6V to 40V	1.05 ~ 1.5	-	-	V
Open Loop Voltage Amplification	A_V	R_F = 200KΩ	70	80	-	dB
Unity Gain Bandwidth	G_{BW}		-	1.5	-	MHz
Common Mode Rejection Ration	**CMRR**		60	80	-	dB
Positive Output Voltage Swing	V_H		2.4	-	-	V
Negative Output Voltage Swing	V_L		-	-	1.0	V
Output Sink Current	I_{SK}	V_{ID} = -0.1V, V_O = 1.25V	0.5	1.6	-	mA
Output Source Current	I_{SR}	V_{ID} = 0.1V, V_O = 1.25V	45	70	-	uA
TOTAL DEVICE						
Standby Supply Current	I_{SS}	**OFF-STATE**	-	1.3	1.8	mA
Average Supply Current	I_{AS}	R_T = 10KΩ	-	1.7	2.4	mA
OSCILLATOR SECTION						
Frequency	F	C_T = 330pF, R_T = 10KΩ	-	200	-	KHz
Standard Deviation Of Frequency	Δ F	C_T = 330pF, R_T = 10KΩ	-	10	-	%
Frequency Change With Voltage	Δ F_V	V_S = 3.6 to 40V	-	1.0	-	%
Frequency Change With Temperature	Δ $F_{T(I)}$	T_A = -20 to +25℃	-	-0.4	2.0	%
	Δ $F_{T(II)}$	T_A = +25 to +85℃	-	-0.2	2.0	%
DEAD TIME CONTROL SECTION						
Input Bias Current (pin6 and 11)	I_B		-	-	1.0	uA
Latch Mode(Source) Current (pin6 and 11)	I_{LM}		80	145	-	uA
Latch Input Voltage (pin6 and 11)	V_L	I_O = 40uA	2.3	-	-	V
Input Threshold Voltage	$V_{TH(I)}$	**ZERO DUTY CYCLE**	-	2.05	2.25	V
A_T T = 10KHz	$V_{TH(II)}$	**MAX. DUTY CYCLE**	1.2	1.45	-	V
OUTPUT SECTION						
Collecor Off State Current	I_C	V_O = 50V	-	-	10uA	nA
Output Saturation Voltage	V_{SAT}	I_O = 10mA	-	1.2	2.0	V
Short Circuit Output Current	I_{SH}	V_O = V_{CC}	-	90	-	mA

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Definition of Terms

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