

# UTC KA7524 LINEAR INTEGRATED CIRCUIT

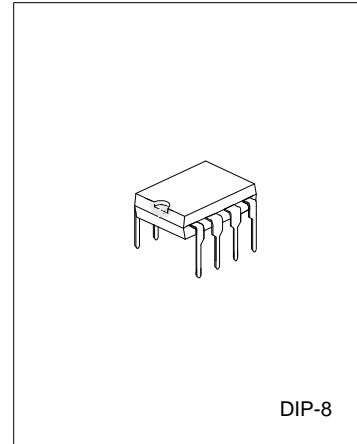
## POWER FACTOR CONTROLLER

### DESCRIPTION

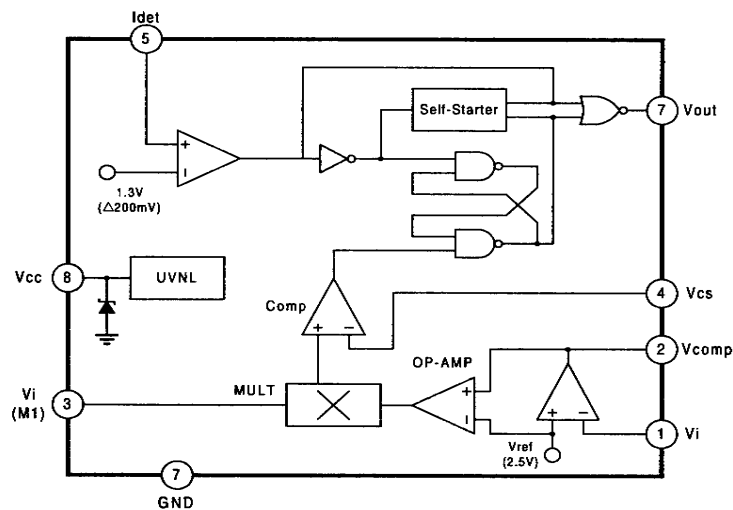
The UTC KA7524 provides the necessary features to implement the Electronic BALLAST control and S.M.P.S application for designing active power factor correction circuit

### FEATURES

- \*Internal self-starting
- \*Micro power start up mode
- \*Included under voltage lockout circuit
- \*Internal 1% reference
- \*High output current: peak 500mA



### BLOCK DIAGRAM



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## ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	Vcc	20	V
Peak Driver Output Current	Io(p)	500	mA
Detect Clamping Diode Current	Idet	10	mA
Output Clamping Diode Current	Io(c.d)	10	mA
Operating Temperature	Topr	-45~65	°C
Storage Temperature	Tstg	-65~150	°C

## ELECTRICAL CHARACTERISTICS (Ta=25°C)

(All voltage referenced to GND unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Under Voltage Lockout Section						
Start Threshold Voltage	Vth(st)		9.2	10	10.8	V
UV lockout Hysteresis	Vths		1.8	2.0	2.2	V
Supply Zener Voltage	Vz			17		V
Supply Current Section						
Start-up Supply Current	Istart	Vcc<Vth		0.25	0.5	mA
Operating Supply Current	Icc	Vcc=12V, No load		6	12	mA
Dynamic Operating Current	Icc(d)	Vcc=12V, f=50KHZ, Cgs=1000pF		10	20	mA
Reference Section (note 1)						
Reference Voltage	Vref		2.475	2.5	2.525	V
Line Regulation	Vref	12V<Vcc<16V		0.1	10	mV
Load Regulation	Vref	0<Iref<2mA		0.1	10	mV
Temperature Stability	STt			20		mV
Error Amplifier Section						
Input Offset Voltage	Vio		-15		15	mV
Input Bias Current	Ibias		-1	-0.1	1	μA
Large Signal Open Loop gain	Gv		60	100		dB
Power Supply Rejection Ratio	PSRR		60	86		dB
Output Current	Isource		2			mA
	Isink				-2	mA
Output Voltage range	Vo(p)		1.2		4	V
Unity Gain Bandwidth	UBW			1.0		MHZ
Phase Margin	MPH			57		°C

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## ELECTRICAL CHARACTERISTICS (Ta=25°C) (continued)

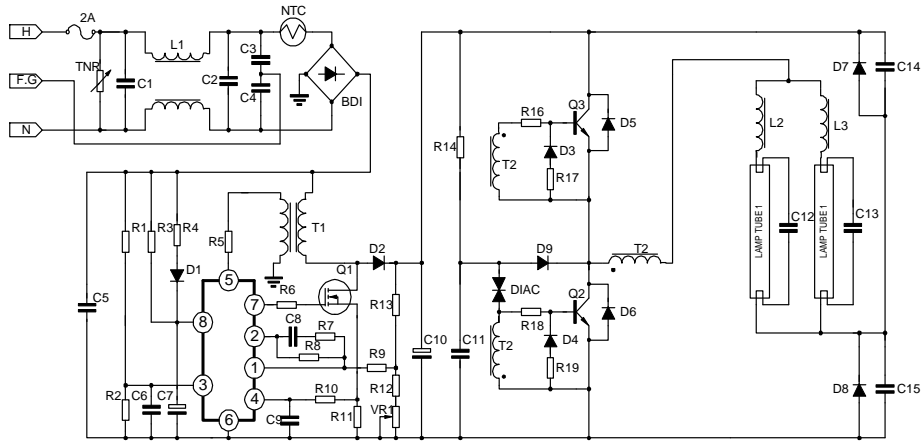
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Multiplier Section						
M1 Input Voltage Range	Vi(m1)		0		2	V
M2 Input Voltage Range	Vi(m2)		Vref		Vref+1	V
Input Bias Current	Ibias		-2	-0.5	2	μA
Multiplier Gain	Gv	Vi(m1)=0.5V, Vi(m2)=3V		0.8		/V
Multiplier Gain Stability	STt			-0.2		%/°C
Current Sense Section						
Input Voltage Threshold	Vth		1.0	1.3	1.6	V
Hysteresis	Vths			200		mV
Input Low Clamp Voltage	Vic(L)	Idet=0mA			0.95	V
Input High Clamp Voltage	Vic(H)	Idet=3mA	6.1	7.1		V
Input Current	Ii	0.8V<Vdet<6V		5		μA
Input Clamp Diode Current	Icd	Vdet<0.9V, Vdet>6V			3	mA
Current Detect Section						
Output Voltage(High)	Vo(H)	Io=-10mA, Vcc=12V	7	9		V
Output Voltage(Low)	Vo(L)	Io=10mA, Vcc=12V		0.8	1.8	V
Rising Time	tr	CL=1000pF		100	200	ns
Falling Time	tf	CL=1000pF		90	200	ns
Self-Start Section						
Self Starting Time	tss		12			μs

### NOTE:

1. Reference can not be tested on the PKG
2.  $Gv = Vo(m) / (Vi(m1) * (Vi(m2) - Vref))$

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## APPLICATION CIRCUIT



## PART LIST

Resistor		R16	5.1Ω	C10	47μF/450V	D6	FR107
R1	1.8M	R17	27Ω	C11	0.1μF	D7	FR107
R2	10K	R18	5.1Ω	C12	3300pF	D8	FR107
R3	100K	R19	27Ω	C13	3300pF	BD1	PBP204
R4	3.3	VR1	5K	C14	0.01μF	TNR	12G471
R5	22K	NTC	10Ω	C15	0.01μF	DIAC	32V
		Capacitor		Semiconductor		Magnetics	
R7	2.2K	C1	0.1μF	IC1	UTC KA7524	T1	E1-25(PC30):P=70T
R8	2.2M	C2	0.1μF	Q1	IRF830		S=4T,Gap=0.5mm
R9	150K	C3	4700pF	Q2	2SC5039	T2	D15(GP-5):
R10	33Ω	C4	4700pF	Q3	2SC5039		P=3T,S=13T
R11	0.75	C5	0.1μF	D1	1N4004	L1	EE-25(Iron Power)
R12	5.1K	C6	0.01μF	D2	1N4937		80mH
R13	1M	C7	100μF	D3	1N4148	L2	E1-25(PC30):
R14	390K	C8	0.1μF	D4	1N4148		150T,Gap=0.4mm
R15	3.9M	C9	3300pF	D5	FR107		