



7524

LINEAR INTEGRATED CIRCUIT

POWER FACTOR CONTROLLER

■ DESCRIPTION

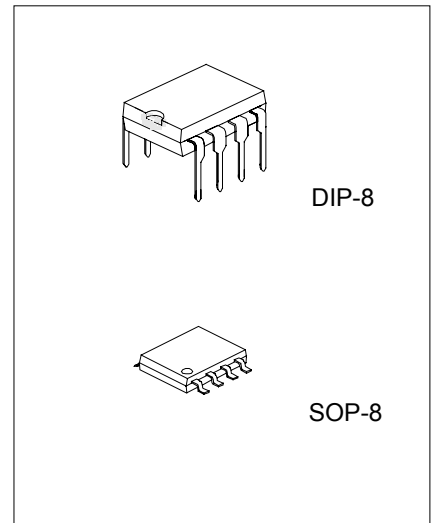
The UTC 7524 provides the necessary features to implement the Electronic BALLAST control and S.M.P.S application for designing active power factor correction circuit

■ FEATURES

- * Internal self-starting
- * Micro power start up mode
- * Included under voltage lockout circuit
- * Internal 2% reference
- * High output current: peak 500mA

■ ORDERING INFORMATION

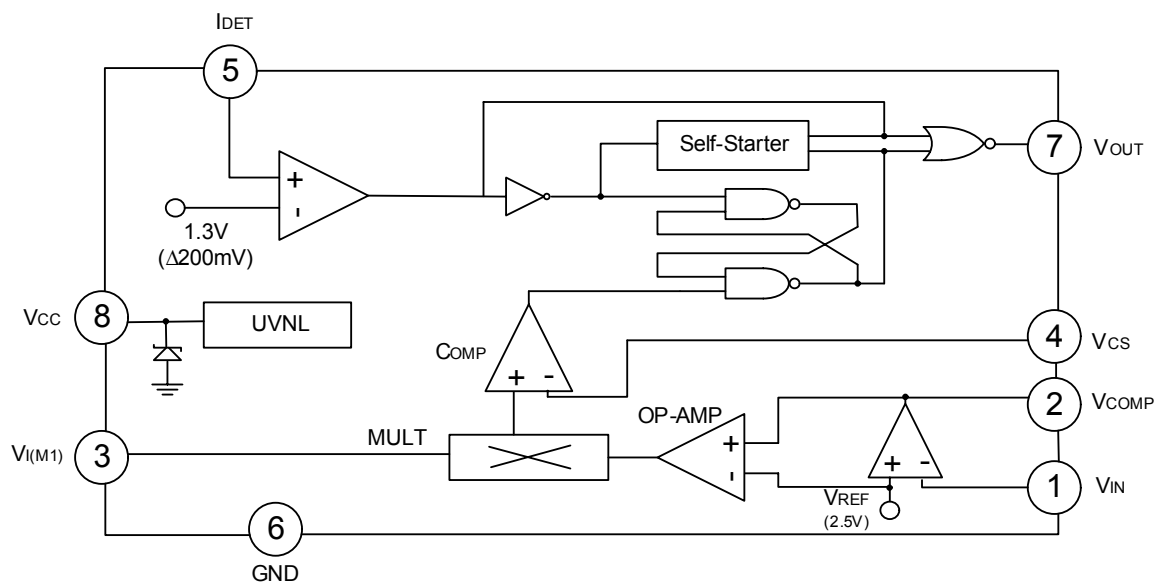
Ordering Number		Package	Packing
Normal	Lead Free Plating		
7524-D08-T	7524L-D08-T	DIP-8	Tube
7524-S08-R	7524L-S08-R	SOP-8	Tape Reel
7524-S08-T	7524L-S08-T	SOP-8	Tube



*Pb-free plating product number: 7524L

7524L-D08-T (1)Packing Type (2)Package Type (3)Lead Plating	(1) T: Tube, R: Tape Reel (2) D08: DIP-8, S08: SOP-8 (3) L: Lead Free Plating, Blank: Pb/Sn
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■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	20	V
Peak Driver Output Current	I _{O(PEAK)}	500	mA
Detect Clamping Diode Current	I _{DET}	10	mA
Output Clamping Diode Current	I _{O(CD)}	10	mA
Junction Temperature	T _J	+125	°C
Operating Temperature	T _{OPR}	-20~+85	°C
Storage Temperature	T _{STG}	-40~+150	°C

Note 1. 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.

2. The device is guaranteed to meet performance specification within 0°C~+70°C operating temperature range and assured by design from -20°C~+85°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	V _{THR(ST)}		9.2	10	10.8	V
UV lockout Hysteresis	V _{HYS(UV)}		1.8	2.0	2.2	V
Supply Zener Voltage	V _Z			17		V
Supply Current Section						
Start-up Supply Current	I _{start}	V _{CC} < V _{I(THR)}		0.25	0.5	mA
Operating Supply Current	I _{CC}	V _{CC} =12V, No load		6	12	mA
Dynamic Operating Current	I _{CC(D)}	V _{CC} =12V, f=50KHZ, C _{GS} =1000pF		10	20	mA
Reference Section (Note 1)						
Reference Voltage	V _{REF}		2.45	2.5	2.55	V
Line Regulation	ΔV _{OUT}	12V < V _{CC} < 16V		0.1	10	mV
Load Regulation	ΔV _{OUT}	0 < I _{REF} < 2mA		0.1	10	mV
Temperature Stability	ST _T			20		mV
Error Amplifier Section						
Input Offset Voltage	V _{I(OFF)}		-15		15	mV
Input Bias Current	I _{I(BIAS)}		-1	-0.1	1	μA
Large Signal Open Loop gain	G _v		60	100		dB
Power Supply Rejection Ratio	RR		60	86		dB
Output Current	I _{SOURCE}		2			mA
	I _{SINK}				-2	mA
Output Voltage range	V _{O(P)}		1.2		4	V
Unity Gain Bandwidth	UB _w			1.0		MHZ
Phase Margin	MPH			57		°C
Multiplier Section						
M1 Input Voltage Range	V _{I(M1)}		0		2	V
M2 Input Voltage Range	V _{I(M2)}		V _{REF}		V _{REF} + 1	V
Input Bias Current	I _{I(BIAS)}		-2	-0.5	2	μA
Multiplier Gain (Note2)	G _v	V _{I(M1)} =0.5V, V _{I(M2)} =3V		0.8		/V
Multiplier Gain Stability	ST _T			-0.2		%/°C
Current Detect Section						
Input Voltage Threshold	V _{I(THR)}		1.0	1.3	1.6	V
Hysteresis	V _{HYS}			200		mV

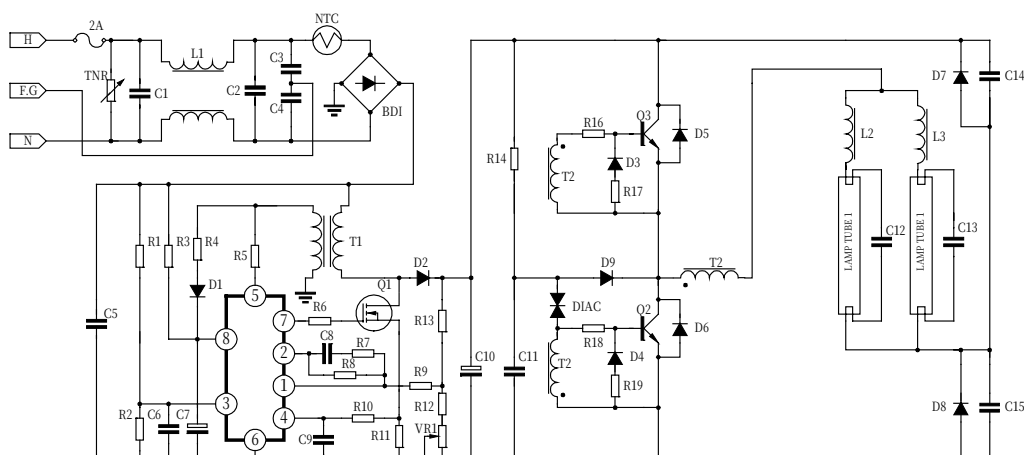
■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Low Clamp Voltage	$V_{IC(L)}$	$I_{DET}=0mA$			0.95	V
Input High Clamp Voltage	$V_{IC(H)}$	$I_{DET}=3mA$	6.1	7.1		V
Input Current	I_{IN}	$0.8V < V_{DET} < 6V$		5		μA
Input Clamp Diode Current	$I_{I(CD)}$	$V_{DET} < 0.9V, V_{DET} > 6V$			3	mA
Output Section						
Output Voltage(High)	$V_{O(H)}$	$I_{OUT}=-10mA, V_{CC}=12V$	7	9		V
Output Voltage(low)	$V_{O(L)}$	$I_{OUT}=10mA, V_{CC}=12V$		0.8	1.8	V
Rising Time	t_R	$C_L=1000pF$		100	200	ns
Falling Time	t_F	$C_L=1000pF$		90	200	ns
Self-Start Section						
Self Starting Time	t_{SS}		12			μs

Note: 1.Reference can not be tested on the PKG

$$2.Gv=V_{O(M)}/(V_{I(M1)}*(V_{I(M2)}-V_{REF}))$$

■ APPLICATION CIRCUIT



PART LIST

Resistor		Capacitor		Semiconductor		Magnetics	
R1	1.8M	C1	0.1 μ F	IC1	UTC 7524	T1	E1-25(PC30):P=70T,S=4T,Gap=0.5mm
R2	10K	C2	0.1 μ F	Q1	IRF830	T2	D15(GP-5):P=3T,S=13T
R3	100K	C3	4700pF	Q2	2SC5039	L1	EE-25(Iron Power),80mH
R4	3.3 Ω	C4	4700pF	Q3	2SC5039	L2	E1-25(PC30):150T,Gap=0.4mm
R5	22K	C5	0.1 μ F	D1	1N4004		
R7	2.2K	C6	0.01 μ F	D2	1N4937		
R8	2.2M	C7	100 μ F	D3	1N4148		
R9	150K	C8	0.1 μ F	D4	1N4148		
R10	330 Ω	C9	3300pF	D5	FR107		
R11	0.75 Ω	C10	47 μ F/450V	D6	FR107		
R12	5.1K	C11	0.1 μ F	D7	FR107		
R13	1M	C12	3300pF	D8	FR107		
R14	390K	C13	3300pF	BD1	PBP204		
R15	3.9M	C14	0.01 μ F	TNR	12G471		
R16	5.1 Ω	C15	0.01 μ F	DIAIC	32V		
R17	27 Ω						
R18	5.1 Ω						
R19	27 Ω						
VR1	5K						
NTC	10 Ω						

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