

# KA7524B

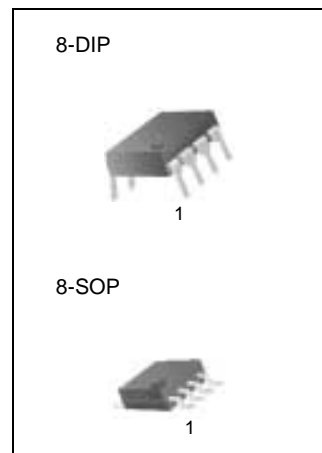
## Power Factor Correction Controller

### Features

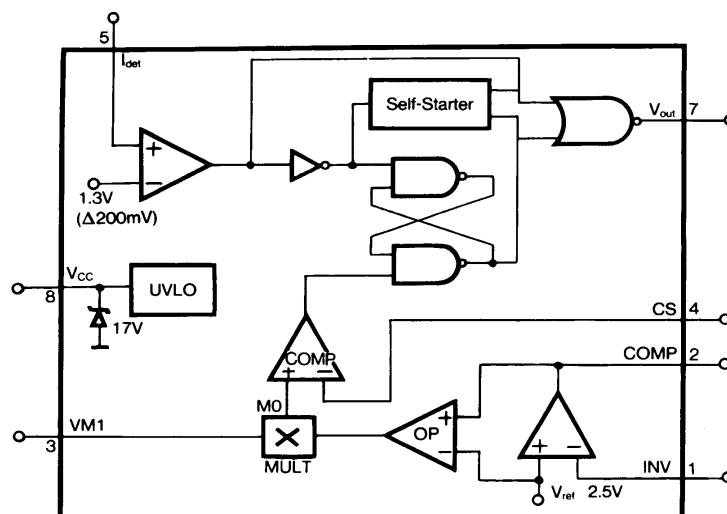
- Internal self-starting
- Micro power start up mode
- Included under voltage lockout circuit
- Internal 1% reference
- High output current : Peak 500mA

### Description

The KA7524B provides the necessary features to implement the Electronic BALLAST control and S.M.P.S application for designing on active power factor correction circuit.

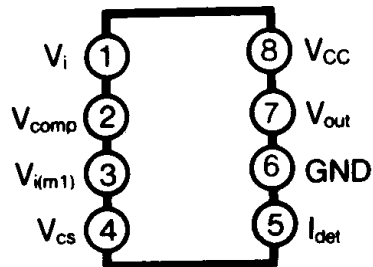


### Internal Block Diagram



## Connection Diagram

KA7524/KA7524D (8 DIP, 8 SOP)



## Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	20	V
Peak Driver Output Current	$I_{O(P)}$	500	mA
Detect Clamping Diode Current	$I_{DET}$	10	mA
Output Clamping Diode Current	$I_{O(C.D)}$	10	mA
Operating Ambient Temperature	$T_{OPR}$	-25 ~ + 100	-
Storage Temperature	$T_{STG}$	-65 ~ + 150	-

## Electrical Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>UNDER VOLTAGE LOCKOUT SECTION</b>						
Start Threshold Voltage	V <sub>TH(ST)</sub>	-	9.2	10	10.8	V
UV Lockout Hysteresis	V <sub>THS</sub>	-	1.8	2.0	2.2	V
Supply Zener Voltage	V <sub>Z</sub>	-	-	17	-	V
<b>SUPPLY CURRENT SECTION</b>						
Start-Up Supply Current	I <sub>START</sub>	V <sub>CC</sub> V <sub>TH</sub>	-	0.25	0.5	mA
Operating Supply Current	I <sub>CC</sub>	V <sub>CC</sub> = 12V, No Load	-	6	12	mA
Dynamic Operating Current	I <sub>CC(D)</sub>	V <sub>CC</sub> = 12V, f = 50KHz, C <sub>GS</sub> = 1000PF	-	10	20	mA
<b>REFERENCE SECTION(NOTE1)</b>						
Reference Voltage	V <sub>REF</sub>	KA7524B/BD	2.475	2.5	2.525	V
Line regulation	V <sub>REF</sub>	12VV <sub>CC</sub> 16V	-	0.1	10	mV
Load Regulation	V <sub>REF</sub>	0I <sub>REF</sub> 2mA	-	0.1	10	mV
Temperature Stability	ST <sub>T</sub>	-	-	20	-	mV
<b>ERROR AMPLIFIER SECTION</b>						
Input Offset Voltage	V <sub>IO</sub>	-	-15	-	15	mV
Input Bias Current	I <sub>BIAS</sub>	-	-1	-0.1	1	uA
Large Signal Open Loop Gain	G <sub>V</sub>	-	60	100	-	dB
Power Supply Rejection Ratio	PSRR	-	60	86	-	dB
Output Current	I <sub>SOURCE</sub>	-	2	-	-	mA
	I <sub>SINK</sub>	-	-	-	-2	mA
Output Voltage Range	V <sub>O(P)</sub>	-	1.2	-	4	V
Unity Gain Bandwidth	UBW	-	-	1.0	-	MHz
Phase Margin	MPH	-	-	57	-	-

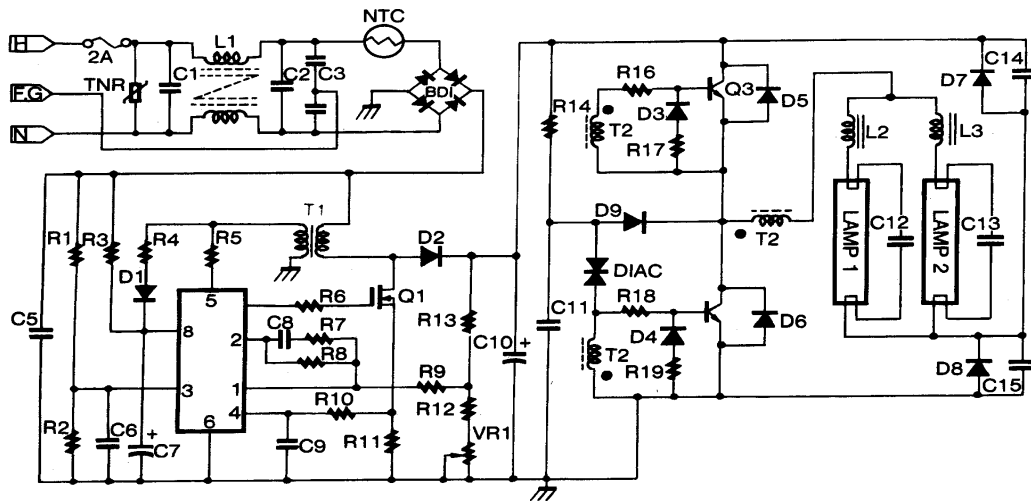
**Electrical Characteristics (Continued)**

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>MULTIPLIER SECTION</b>						
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 <sub>BIAS</sub>	-	-2	-0.5	2	uA
Multiplier Gain (Note2)	G <sub>V</sub>	$V_{I(M1)} = 0.5V, V_{I(M2)} = 3V$	-	0.8	-	uA
Multiplier Gain Stability	ST <sub>T</sub>	-	-	-0.2	-	/
<b>CURRENT SENSE SECTION</b>						
Input Offset Voltage	$V_{IO}$	-	-10	-	10	mV
Input Bias Current	I <sub>BIAS</sub>	$0V_{CS}1.7V$	-5	-	5	uA
C. Sense Delay to Output	$t_{D(S)}$	Error Amp Output = 3.7V	-	200	500	nS
<b>CURRENT DETECT SECTION</b>						
Input Voltage Threshold	$V_{TH}$	-	1.0	1.3	1.6	V
Hysteresis	$V_{THS}$	-	-	200	-	mV
Input Low Clamp Voltage	$V_{IC(L)}$	I <sub>DET</sub> = 0mA	-	-	0.95	V
Input High Clamp Voltage	$V_{IC(H)}$	I <sub>DET</sub> = 3mA	6.1	7.1	-	V
Input Current	I <sub>J</sub>	$0.9V_{DET}6V$	-	5	-	uA
Input Clam Diode Current	I <sub>CD</sub>	$V_{DET}0.9V, V_{DET}6V$	-	-	3	mA
<b>CURRENT DETECT SECTION</b>						
Output Voltage(High)	$V_{O(H)}$	I <sub>O</sub> = -10mA, V <sub>CC</sub> = 12V	7	9	-	V
Output Voltage(Low)	$V_{O(L)}$	I <sub>O</sub> = 10mA, V <sub>CC</sub> = 12V	-	0.8	1.8	V
Rising Time	$t_R$	CL = 1000pF	-	100	200	nS
Falling Time	$t_F$	CL = 1000pF	-	90	200	nS
<b>SELF-STARTING SECTION</b>						
Self-Starting Time	t <sub>SS</sub>	-	12	-	-	uS

**Notes :**

- Reference can not be tested on the PKG
- $G_V = V_{O(M)} / (V_{I(M1)}V_{I(M2)} - V_{REF})$

## KA7524B Application Circuit



## Part List

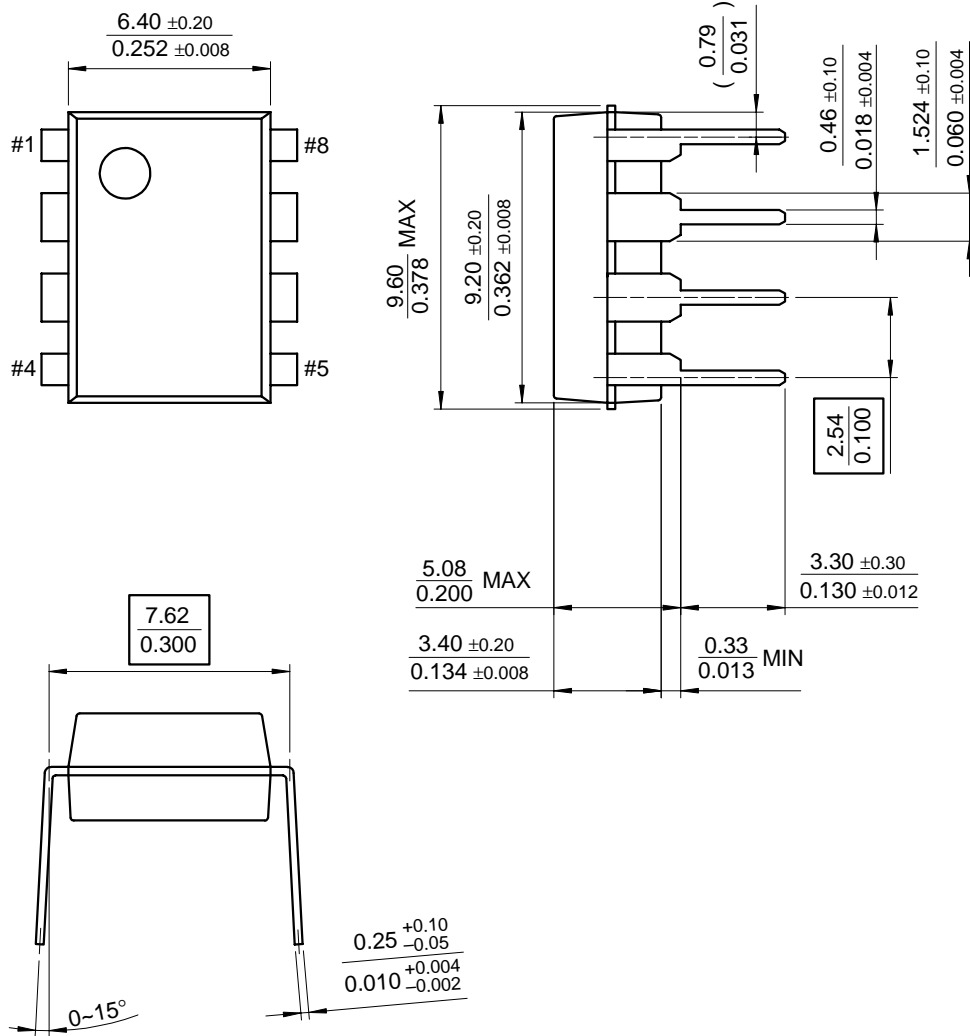
Resistor		Capacitor		Semiconductor	
R1	1.8M	C1	0.1uF	IC1	KA7524B
R2	10K	C2	0.1uF	Q1	IRF830
R3	100K	C3	4700pF	Q2	KSC5039
R4	3.3ohm	C4	4700pF	Q3	KSC5039
R5	22K	C5	0.1uF	D1	1N4004
R6	27ohm	C6	0.01uF	D2	1N4937
R7	2.2K	C7	100uF	D3	1N4148
R8	2.2M	C8	0.1uF	D4	1N4148
R9	150K	C9	3300pF	D5	FR107
R10	330ohm	C10	47uF/450V	D6	FR107
R11	0.75ohm	C11	0.1uF	D7	FR107
R12	5.1K	C12	3300pF	D8	FR107
R13	1M	C13	3300pF	BD1	PBP204
R14	390K	C14	0.01uF	TNR	12G471
R15	3.9M	C15	0.01uF	DIAIC	32V
R16	5.1ohm	Magnetics			
R17	27ohm	T1	EI-25 (PC30): P = 70T, S = 4T, Gap = 0.5mm		
R18	5.1ohm	T2	D15 (GP-5): P = 3T, S = 13T		
R19	27ohm	L1	EE-25 (Iron Power) 80mH		
VR1	5K	L2, L3	EI-25 (PC30): 150T, Gap = 0.4mm		
NTC	10ohm				

# Mechanical Dimensions

## Package

Dimensions in millimeters

### 8-DIP

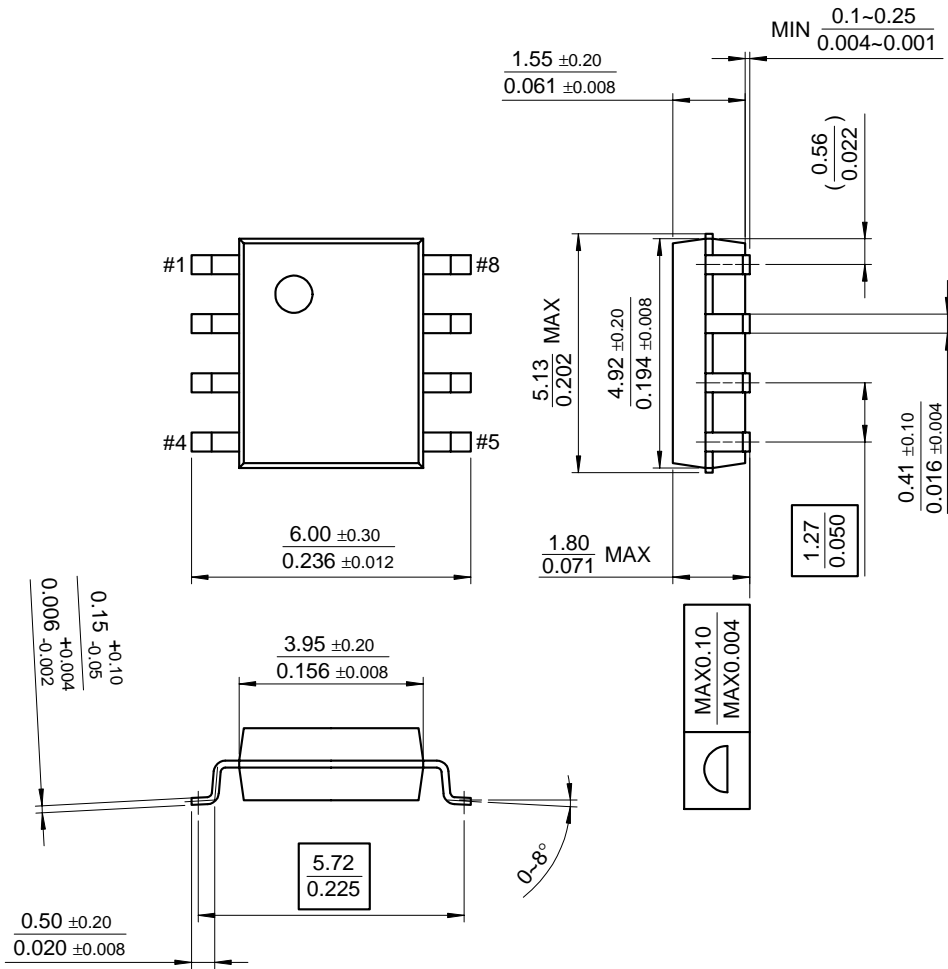


**Mechanical Dimensions** (Continued)

Package

Dimensions in millimeters

**8-SOP**



**Ordering Information**

Product Number	Package	Operating Temperature
KA7524B	8-DIP	-25°C ~ +100°C
KA7524BD	8-SOP	





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