

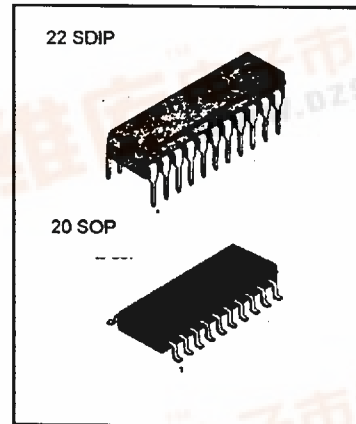


**BALLAST CONTROL IC**

The KA7522 is a electronic ballast controller for fluorescent inverter systems. It contains whole function in KA7521, current feed back and preheating time controlled by temperature sensing.

**FEATURES**

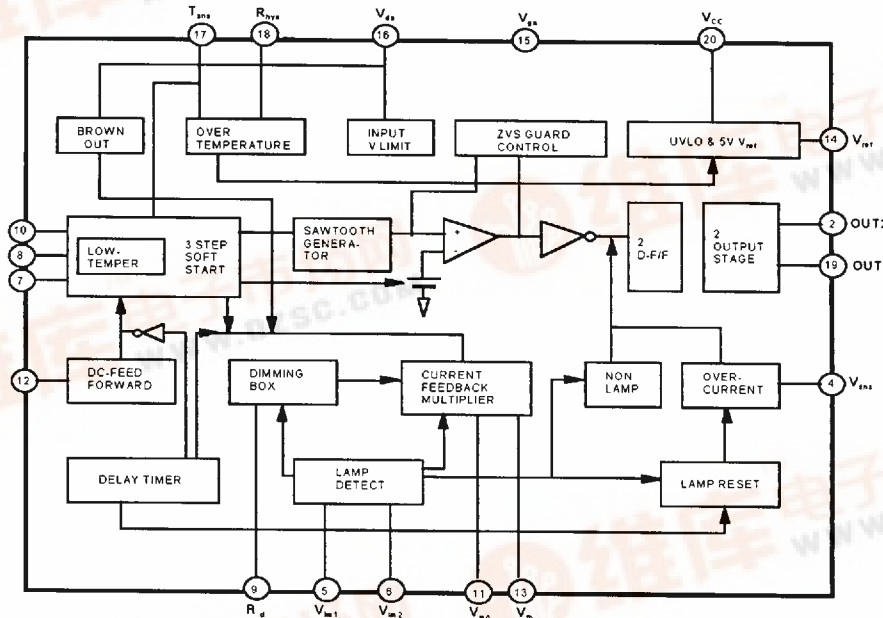
- 3-step soft start
- Input voltage limit & Brown out
- Non Lamp detect, & Lamp reset
- ZVS Guard control
- Current feedback control
- Preheating time controlled by temperature sensing



**ORDERING INFORMATION**

Device	Package	Operating Temperature
KA7522	22 SDIP	-25 ~ + 100 °C
KA7522D	20 SOP	-25 ~ + 100 °C

**BLOCK DIAGRAM**



**ABSOLUTE MAXIMUM RATINGS** ( $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Characteristic	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	20	V
Peak driver output current	$I_{OP}$	500	mA
Operating ambient temperature	$T_{OPR}$	-25 ~ +100	$^\circ\text{C}$
Storage temperature	$T_{STG}$	-65 ~ +150	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS**

( $V_{CC} = 12\text{V}$ ,  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Under Voltage Lock Out Section</b>						
Start-Up Threshold Voltage	$V_{ST}$		11.4	12.4	13.4	V
UVLO Hysteresis	$V_{THS}$		3.6	4.2	4.8	V
Start-Up Supply Current	$I_{ST}$	$V_{CC} = 9\text{V}$	0.5	0.8	1.1	mA
Operating Supply Current	$I_{CC}$	$V_{CC} = 14\text{V}$ , No Load	8	10.5	13	mA
<b>Reference Section</b>						
Reference Voltage	$V_{REF}$		5.0	5.1	5.2	V
Load Regulation	$\Delta V_{REF}$	$0 < I_{REF} < 5\text{mA}$	—	5	20	mV
<b>Preheating Section</b>						
Preheating Frequency	$F_P$	$V_{CS} = 0\text{V}$	125	145	165	KHz
Preheating Time Current	$I_P$	$V_{CS} = 0\text{V}$	8	14	20	$\mu\text{A}$
Preheating Dead Time	$T_{PD}$		2.5	3	3.5	$\mu\text{s}$
<b>Oscillator Section</b>						
Amplitude	$V_{(OSC)}$		3.0	3.4	3.8	V
Normal Frequency	$F_N$		80	100	120	KHz
Normal Dead Time	$T_{ND}$	$V_{CS} = 2\text{V}$	2.4	2.9	3.4	$\mu\text{s}$
<b>3-step Frequency Section</b>						
Preheating Voltage Range	$V_{PR}$		0.6	1	1.4	V
Soft start Voltage Range	$V_{SR}$		1.2	1.6	2.0	V

**ELECTRICAL CHARACTERISTICS**

(V<sub>CC</sub> = 12V, T<sub>A</sub> = 25 °C, unless otherwise specified)

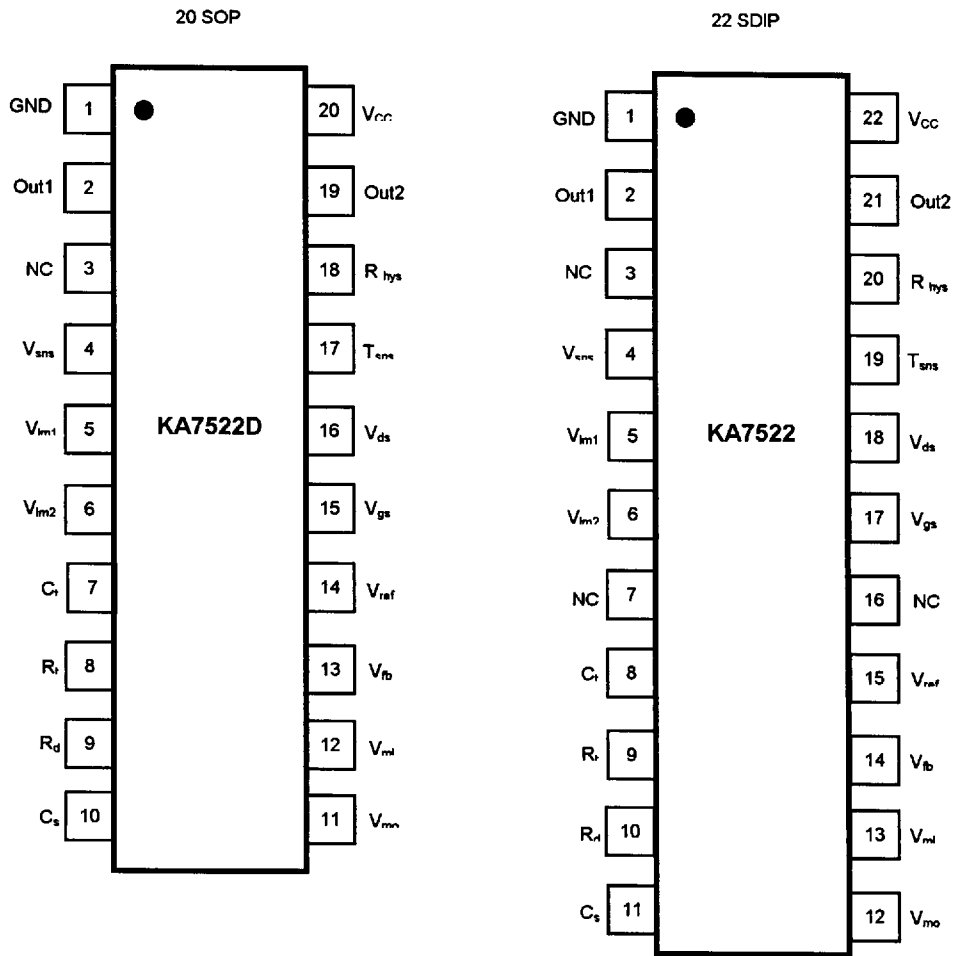
Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Dimming Control Section</b>						
Dimming Current	I <sub>DIM</sub>	R <sub>D</sub> = 120K Ω	26	33	40	μ A
<b>Option Comparator</b>						
Option Comparator Voltage	V <sub>OPT</sub>		2.7	3.1	3.5	V
<b>Option Section</b>						
Rising time	T <sub>R</sub>	No Load, V <sub>CC</sub> = 10V	—	80	120	ns
Falling time	T <sub>F</sub>	No Load, V <sub>CC</sub> = 10V	—	20	100	ns
High Voltage	V <sub>OH</sub>	I <sub>O</sub> = 30mA, V <sub>CC</sub> = 10V	7	8	—	V
Low Voltage	V <sub>OI</sub>	I <sub>O</sub> = 30mA, V <sub>CC</sub> = 10V	—	0.1	0.4	V
<b>Over Temperature Protection</b>						
High Temperature Voltage	V <sub>HT</sub>		0.4	0.8	1.2	V
Reset Temperature Voltage	V <sub>RT</sub>		1.7	2.1	2.5	V
Hysteresis Max Current	I <sub>HYS</sub>		80	100	120	μ A
<b>Input Voltage Limit</b>						
High Limit Voltage	V <sub>H(LIM)</sub>	R <sub>DS</sub> = 12K Ω	4.8	5.3	5.8	V
High Limit Hysteresis	V <sub>HYS(H)</sub>	R <sub>DS</sub> = 12K Ω	4.3	4.8	5.3	V
Low Limit Voltage	V <sub>L(LIM)</sub>	R <sub>DS</sub> = 12K Ω	1.1	1.6	2.1	V
Low Limit Hysteresis	V <sub>HYS(L)</sub>	R <sub>DS</sub> = 12K Ω	1.6	2.1	2.6	V
<b>Lamp Detection</b>						
Lamp1 Detect Voltage	V <sub>IM1</sub>		1.2	1.4	1.6	V
Lamp2 Detect Voltage	V <sub>IM2</sub>		1.2	1.4	1.6	V
<b>Temperature Sense</b>						
Negative Preheating Current	I <sub>PC</sub>		2	6	10	μ A
<b>Multiplier Section</b>						
Multiplier Gain (NOTE)	G <sub>M</sub>		—	0.01	0.02	
Multiplier Input 1 Current	I <sub>ML</sub>	R <sub>ML</sub> = M Ω, V <sub>ML</sub> = 27V	22	26	30	μ A
Multiplier Input 2 Current	I <sub>FB</sub>	V <sub>FB</sub> = GND	18	30	42	μ A

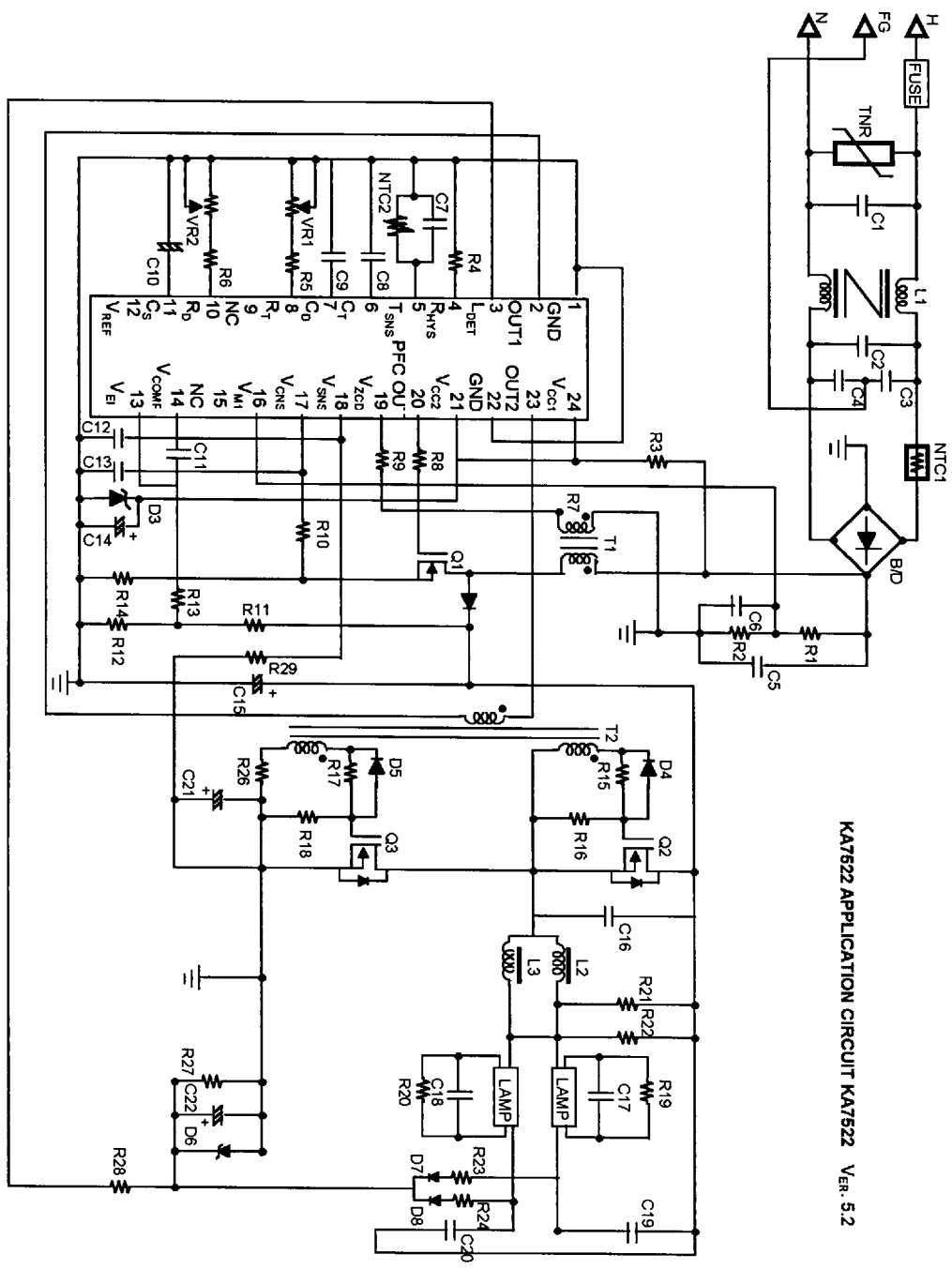
**ELECTRICAL CHARACTERISTICS**

( $V_{CC} = 12V$ ,  $T_A = 25^\circ C$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Brown Out Section</b>						
Brown out Voltage	$V_{BO}$		2.3	2.7	3.1	V
Brown out Hysteresis	$V_{BYS}$		2.6	3	3.4	V
<b>Time Delay Section</b>						
Start Feedback Voltage	$V_{SF}$		2.5	2.9	3.3	V
<b>DC Feed Forward Section</b>						
Feed Forward Current	$I_{FF}$		19	23	27	$\mu A$
<b>ZVS Guard Section 0.4</b>						
High Sense Voltage	$V_{HS}$		0.05	0.2	0.4	mV
Low Sense Voltage	$V_{LS}$		0.05	0.2	0.4	mV

PIN CONNECTION (top view)





KA7522 APPLICATION CIRCUIT KA7522 Ver. 5.2

PARTS LIST (KA7522/D)

Part	Value	Part	Value	Part	Value
R1	100K $\Omega$ 1W	R30	1K $\Omega$	D1	1N4937
R2	100K $\Omega$ 1W	VR1	500K $\Omega$	D2	1N4937
R3	2K $\Omega$			D3	1N4937
R4	22K $\Omega$	C1	0.1 $\mu$ F 250V	D4	1N4937
R5	1K $\Omega$	C2	0.1 $\mu$ F 250V	D5	1N4937
R6	10 $\Omega$ 1/2W	C3	4700pF 250V	D6	1N4937
R7	50K $\Omega$	C4	4700pF 250V		
R8	36K $\Omega$	C5	0.1 $\mu$ F 315V		
R9	1K $\Omega$	C6	22 $\mu$ F 24V		
R10	1K $\Omega$	C7	330 $\mu$ F 10V		
R11	2K $\Omega$	C8	10 $\mu$ F 10V	ZD1	15V 1W
R12	1.2 $\Omega$	C9	104 10V	ZD2	3.9V 0.5W
R13	100 $\Omega$ 1W	C10	104 10V	ZD3	3.9V 0.5W
R14	22 $\Omega$	C11	102 10V		
R15	22 $\Omega$	C12	68 $\mu$ F 450V		
R16	1M $\Omega$	C13	152 630V	Q1	KSP44
R17	12K $\Omega$	C14	822 1000V	Q2	KSP44
R18	390K $\Omega$	C15	822 1000V	Q3	IRF830
R19	390K $\Omega$	C16	103 630V	Q4	IRF830
R20	1M $\Omega$	C17	103 630V		
R21	1M $\Omega$	C18	103 630V	L1	BSF-2125
R22	390K $\Omega$	C19	103 630V	T1	EE1619
R23	390K $\Omega$	C20	1 $\mu$ F 10V	T2	EI25
R24	30K $\Omega$	C21	22 $\mu$ F 10V	T3	EI25
R25	1 $\Omega$	C22	1 $\mu$ F 10V		
R26	30K $\Omega$			B/D	KBL205
R27	12K $\Omega$	TNR	12G471K	IC	KA7522D
R28	1M $\Omega$	NTC1	10D-11		
R29	1M $\Omega$	NTC2	KTD5-350	FUSE	250V/2A

Dimensions in Millimeters

