KA7522/D   DIMMING BALLAST CONTROL IC

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

22 DIP
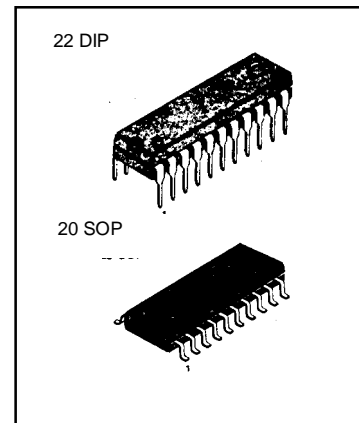
20 SOP

ORDERING INFORMATION

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

BLOCK DIAGRAM

Rev. B
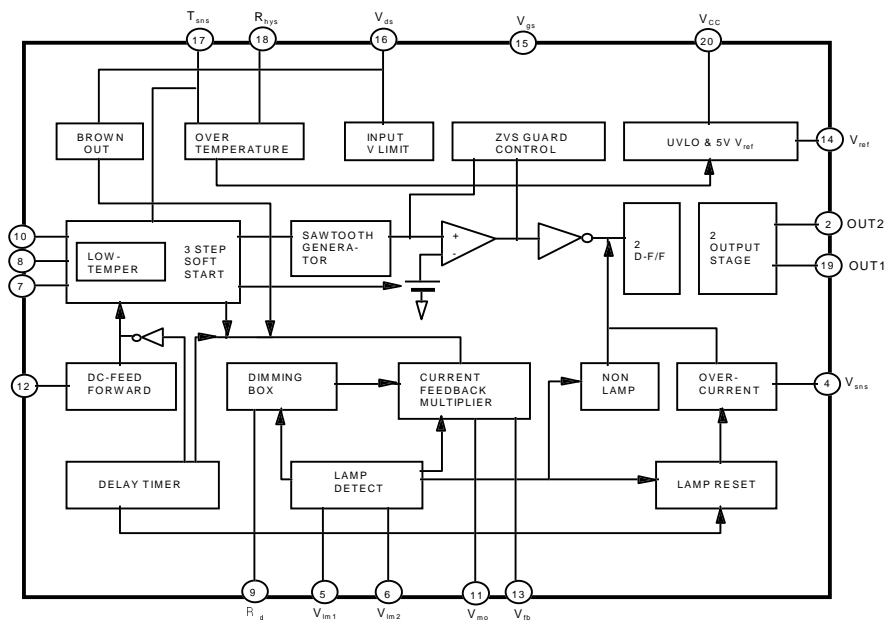
ABSOLUTE MAXIMUM RATINGS (T_A = 25 ℃, unless otherwise specified)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	20	V
Peak driver output current	$I_{O(P)}$	500	mA
Operating ambient temperatute	$T_{(OPR)}$	-25 ~ +100	℃
Storage temperature	T_{STG}	-65 ~ +150	℃

ELECTRICAL CHARACTERISTICS

(V_{CC} = 12V, T_A = 25 ℃, unless otherwise specified)

Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Under Voltage Lock Out Section						
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} = 9V	0.5	0.8	1.1	mA
Operating Supply Current	I_{CC}	V_{CC} = 14V, No Load	8	10.5	13	mA
Reference Section						
Reference Voltage	V_{REF}		5.0	5.1	5.2	V
Load Regulation	ΔV_{REF}	0 < I_{REF} < 5mA	–	5	20	mV
Preheating Section						
Preheating Frequency	F_P	V_{CS} = 0V	125	145	165	KHz
Preheating Time Current	I_P	V_{CS} = 0V	8	14	20	μ A
Preheating Dead Time	T_{PD}		2.5	3	3.5	μ A
Oscillator Section						
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} = 2V	2.4	2.9	3.4	μ s
3-step Frequency Section						
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_{CC} = 12V, T_A = 25℃, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Dimming Control Section						
Dimming Current	I_{DIM}	R_D = 120KΩ	26	33	40	μ A
Option Comparator						
Option Comparator Voltage	V_{OPT}		2.7	3.1	3.5	V
Option Section						
Rising time	T_R	No Load, V_{CC} = 10V	–	80	120	ns
Falling time	T_F	No Load, V_{CC} = 10V	–	20	100	ns
High Voltage	V_{OH}	I_O = 30mA, V_{CC} = 10V	7	8	–	V
Low Voltage	V_{OI}	I_O = 30mA, V_{CC} = 10V	–	0.1	0.4	V
Over Temperature Protection						
High Temperature Voltage	V_{HT}		0.4	0.8	1.2	V
Reset Temperature Voltage	V_{RT}		1.7	2.1	2.5	V
Hysteresis Max Current	I_{HYS}		80	100	120	μ A
Input Voltage Limit						
High Limit Voltage	$V_{H(LIM)}$	R_{DS} = 12KΩ	4.8	5.3	5.8	V
High Limit Hysteresis	$V_{HYS(H)}$	R_{DS} = 12KΩ	4.3	4.8	5.3	V
Low Limit Voltage	$V_{I(LIM)}$	R_{DS} = 12KΩ	1.1	1.6	2.1	V
Low Limit Hysteresis	$V_{HYS(I)}$	R_{DS} = 12KΩ	1.6	2.1	2.6	V
Lamp Detection						
Lamp1 Detect Voltage	V_{IM1}		1.2	1.4	1.6	V
Lamp2 Detect Voltage	V_{IM2}		1.2	1.4	1.6	V
Temperature Sense						
Negative Preheating Current	$I_{P(-)}$		2	6	10	μ A
Multiplier Section						
Multiplier Gain (NOTE)	G_M		–	0.01	0.02	
Multiplier Input 1 Current	I_{ML}	R_{ML} = MΩ, V_{ML} = 27V	22	26	30	μ A
Multiplier Input 2 Current	I_{FB}	V_{FB} = GND	18	30	42	μ A

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ELECTRICAL CHARACTERISTICS

(V_{CC} = 12V, T_A = 25℃ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Brown Out Section						
Borwn out Voltage	V_{BO}		2.3	2.7	3.1	V
Borwn out Hysteresis	V_{BYS}		2.6	3	3.4	V
Time Delay Section						
Start Feedback Voltage	V_{SF}		2.5	2.9	3.3	V
DC Feed Forward Section						
Feed Forward Current	I_{FF}		19	23	27	μ A
ZVS Guard Section0.4						
High Sense Voltage	V_{HS}		0.05	0.2	0.4	mV
Low Sense Voltage	V_{IS}		0.05	0.2	0.4	mV

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PIN CONNECTION (top view)

20 SOP

GND	1	●	20	V_{CC}
Out1	2		19	Out2
NC	3		18	R_{hys}
V_{sns}	4		17	T_{sns}
V_{lm1}	5	**KA7522D**	16	V_{ds}
V_{lm2}	6		15	V_{gs}
C_t	7		14	V_{ref}
R_t	8		13	V_{fb}
R_d	9		12	V_{ml}
C_s	10		11	V_{mo}

22 DIP

GND	1	●	22	V_{CC}
Out1	2		21	Out2
NC	3		20	R_{hys}
V_{sns}	4		19	T_{sns}
V_{lm1}	5	**KA7522**	18	V_{ds}
V_{lm2}	6		17	V_{gs}
NC	7		16	NC
C_t	8		15	V_{ref}
R_t	9		14	V_{fb}
R_d	10		13	V_{ml}
C_s	11		12	V_{mo}

KA7522 APPLICATION

VER. 7.1
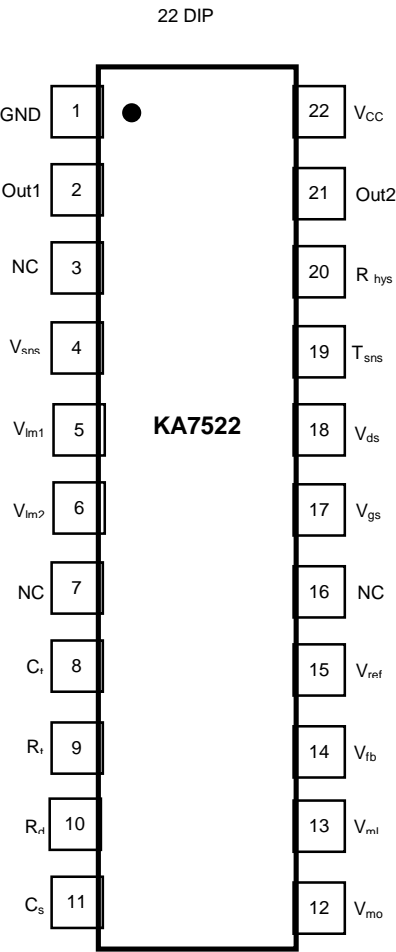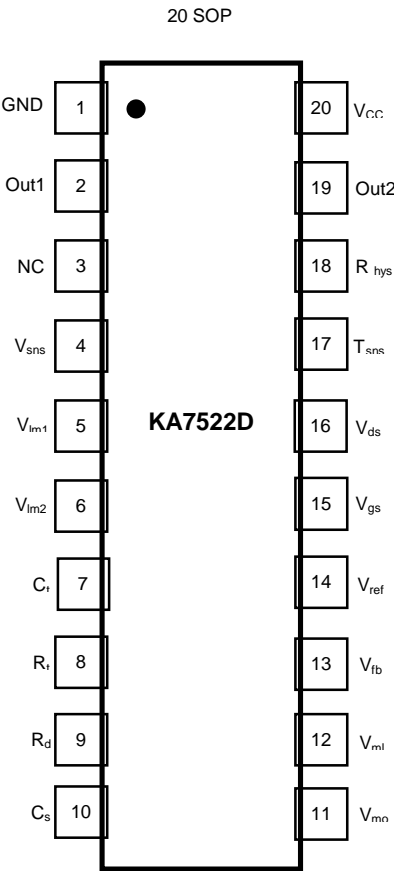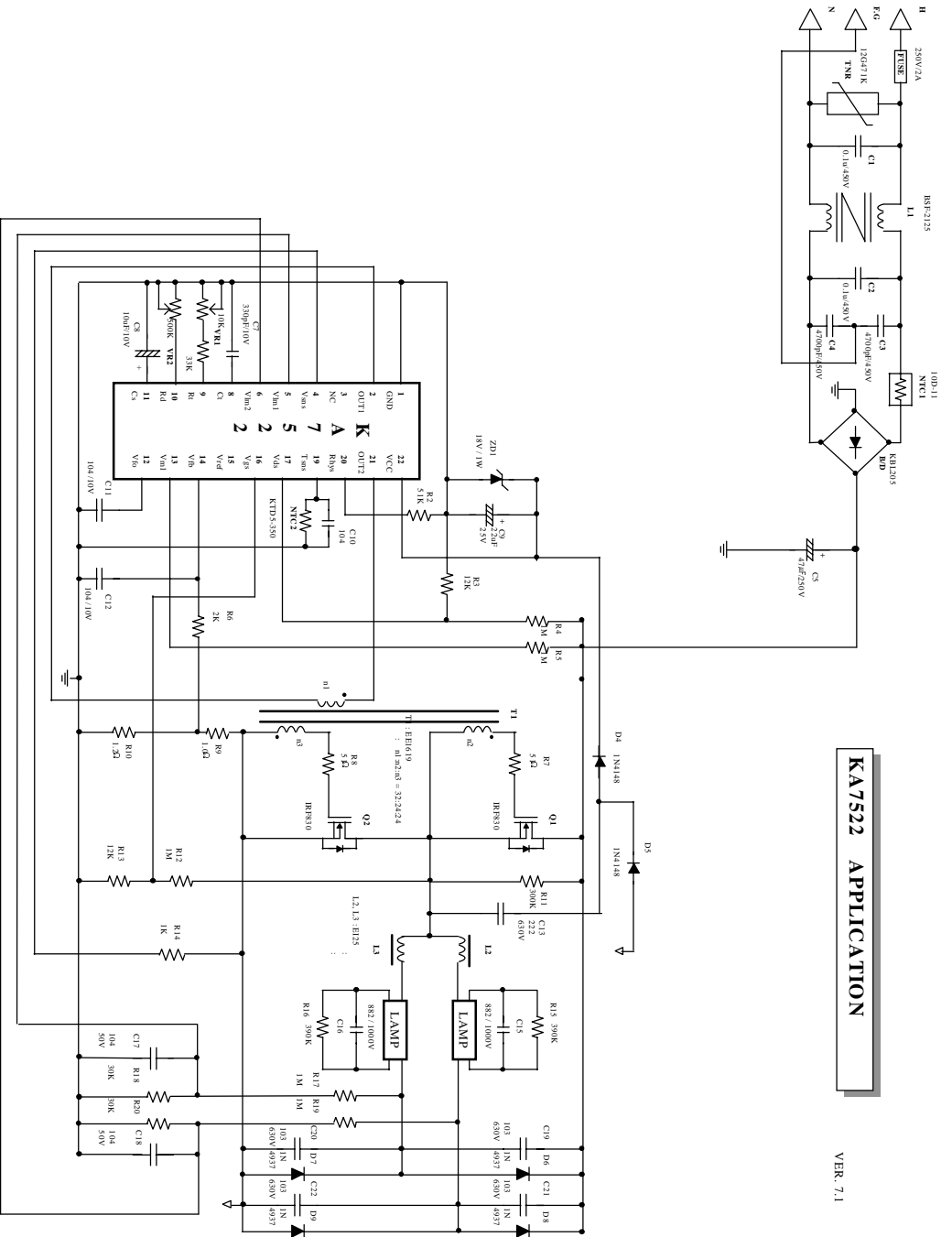
PARTS LIST (KA7522/D)

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

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