KA7511

SMPS Controller

Features

- Wide Operating Range
- Under Voltage Lockout
- Direct Switching TR Drive
- Low Start-Up Current

Description

The KA7511 drives, regulates and monitors the main switching element in a SMPS based on the nonsynchronous flyback theory. Because of the wide regulating range and the high voltage stability during large load changes, the power supplies for TV receivers and video recorders can be realized.

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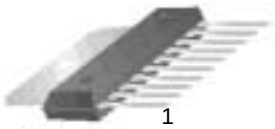
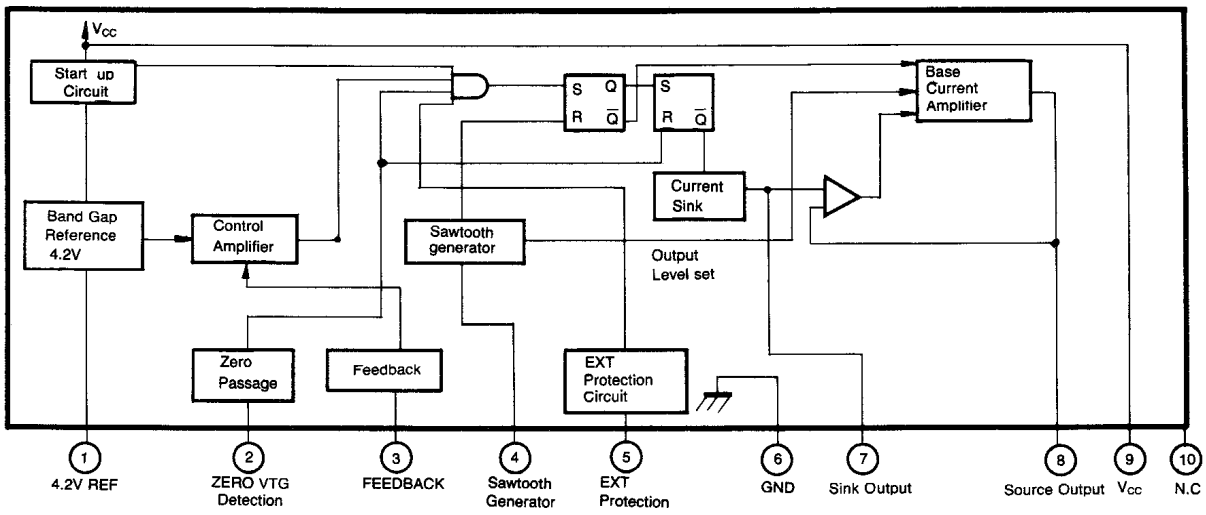


Internal Block Diagram



Rev. 5.0

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Absolute Maximum Ratings (T_A=25°C)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	20	V
Reference Output Voltage	V_{REF}	6	V
Zero Passage Identification Voltage	V_2	± 0.6	V
Control Amplifier Voltage	V_3	3	V
Collector Current Simulation Voltage	V_4	8	V
Blocking Input Voltage	V_5	8	V
Base Current Cut-Off Point Voltage	V_7	V_9	V
Base Current Amplifier Output Voltage	V_8	V_9	V
Collector Current Simulation Current	I_4	5	mA
Blocking Input Current	I_5	5	mA
Base Current Cut-Off Point Current	I_7	1.5	A
Base Current Amplifier Output Current	I_8	-1.5	A
Operating Temperature Range	T_A	0 ~ +70	°C

Electrical Characteristics

(T_A = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	V_{CC}	-	-	15	18	V
Start Operation						
Supply Current (1)	I_{CC1}	V_9 = 2V	-	-	0.5	mA
(2)	I_{CC2}	V_9 = 5V	-	1.5	2.0	mA
(3)	I_{CC3}	V_9 = 10V	-	2.4	3.2	mA
Switch On V_1	V_9	-	11.0	11.8	12.3	V

Electrical Characteristics

(T_A = +25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Normal Operation (V_{CC} = 10V, $V_{(CTRL)}$ = -10V, $V_{(CLK)}$ = ± 0.5V, f = 20KHz, D = 0.5)						
Supply Current (4)	I_{CC4}	$V_{(CTRL)}$ = -10V	110	135	160	mA
(5)	I_{CC5}	$V_{(CTRL)}$ = 0V	50	75	100	mA
Reference Voltage(1)	V_{REF1}	$I_1 \le 0.1$mA	4.0	4.2	4.5	V
(2)	V_{REF2}	I_1 = 5mA	4.0	4.2	4.4	V
Temperature Coefficient Of V_{REF}	$\Delta V_{REF}/\Delta T$	-	-	0.1	-	%
Control Voltage	V_3	$V_{(CTRL)}$ = 0V	2.3	2.6	2.9	V
Collector Current Simulation Voltage	V_4	$V_{(CTRL)}$ = 0V	1.8	2.2	2.5	V
	ΔV_4	$V_{(CTRL)}$ = 0 ~ -10V	0.3	0.4	0.5	V
Clamping Voltage	V_5	-	6	7	8	V
Output Voltage	V_7	$V_{(CTRL)}$ = 0V	2.7	3.3	4.0	V
	V_8	$V_{(CTRL)}$ = 0V	2.7	3.4	4.0	V
	ΔV_8	$V_{(CTRL)}$ = 0 ~ -10V	1.6	2.0	2.4	V
Feedback Voltage	V_2	-	-	0.2	-	V
Protective Operation (V_{CC} = 10V, $V_{(CTRL)}$ = -10V, $V_{(CLK)}$ = ± 0.5V, f = 20KHz, D = 0.5)						
Supply Current (6)	I_{CC6}	$V_5 \le 1.9$V	14	22	28	mA
Switch-Off Voltage (1)	$V_{7(OFF)}$	$V_5 \le 1.9$V	1.3	1.5	1.8	V
(2)	$V_{4(OFF)}$	$V_5 \le 1.9$V	1.8	2.1	2.5	V
Blocking Input Voltage	$V_{5(B)}$	$V_{(CTRL)}$ = 0V	$V_1/2$- 0.1	$V_1/2$	-	V
V_8 Off Voltage	$V_{9(OFF)}$	$V_{(CTRL)}$ = 0V	6.7	7.4	7.8	V
V_1 Off Voltage	$\Delta V_{9(OFF)}$	$V_{(CTRL)}$ = 0V	0.3	0.6	1	V

Note :
* After Switch-On

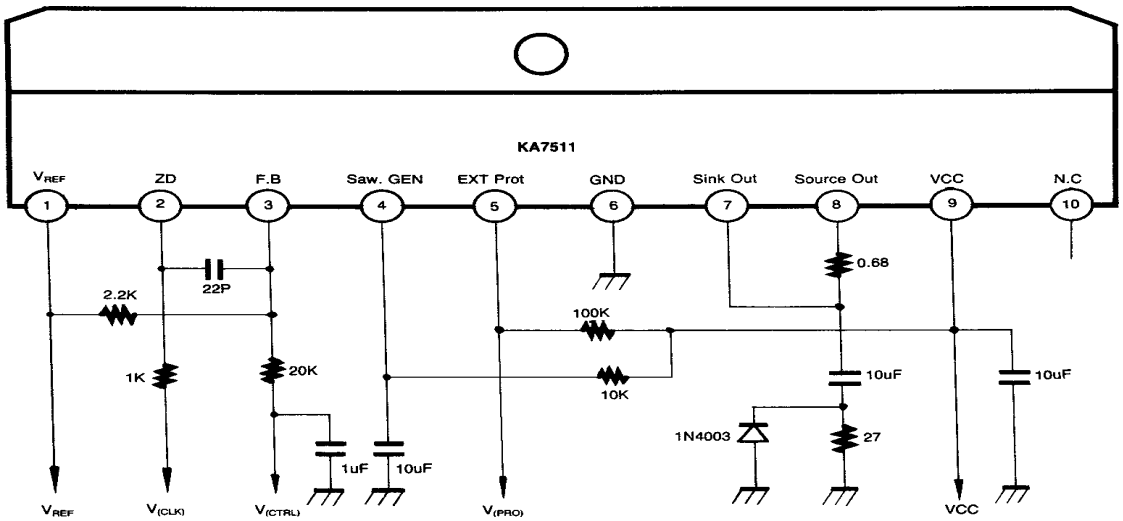

Figure 1. Test Circuit

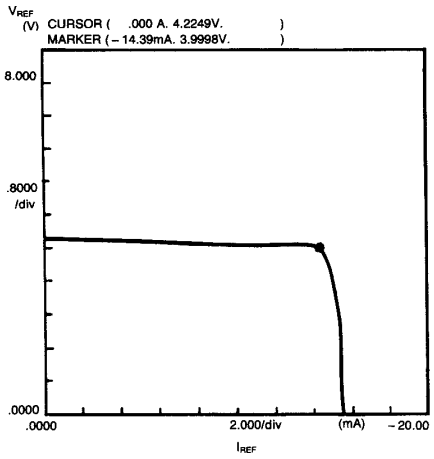

Figure 2. V_{REF} Vs I_{REF} (T_A=25°C)

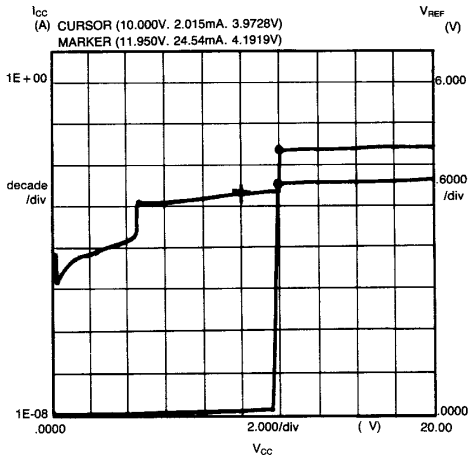

Figure 3. I_{CC} Vs V_{REF} (T_A=25°C)

Mechanical Dimensions

Package

Dimensions in millimeters

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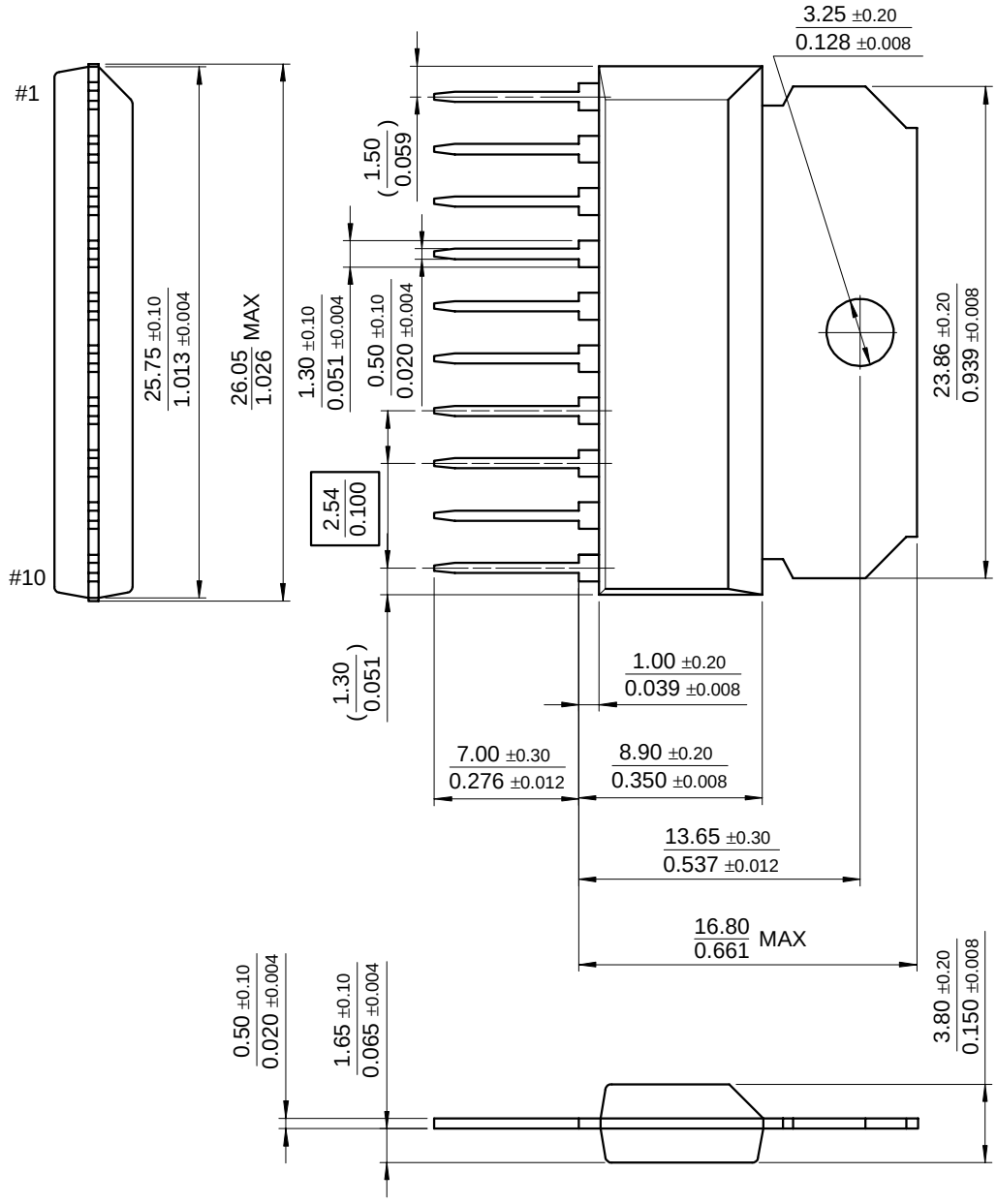

Ordering Information

Product Number	Package	Operating Temperature
KA7511	10-SIP H/S	0 ~ +70°C

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