

KA7511

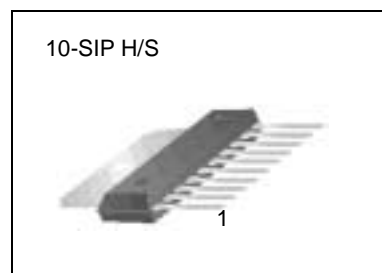
SMPS Controller

Features

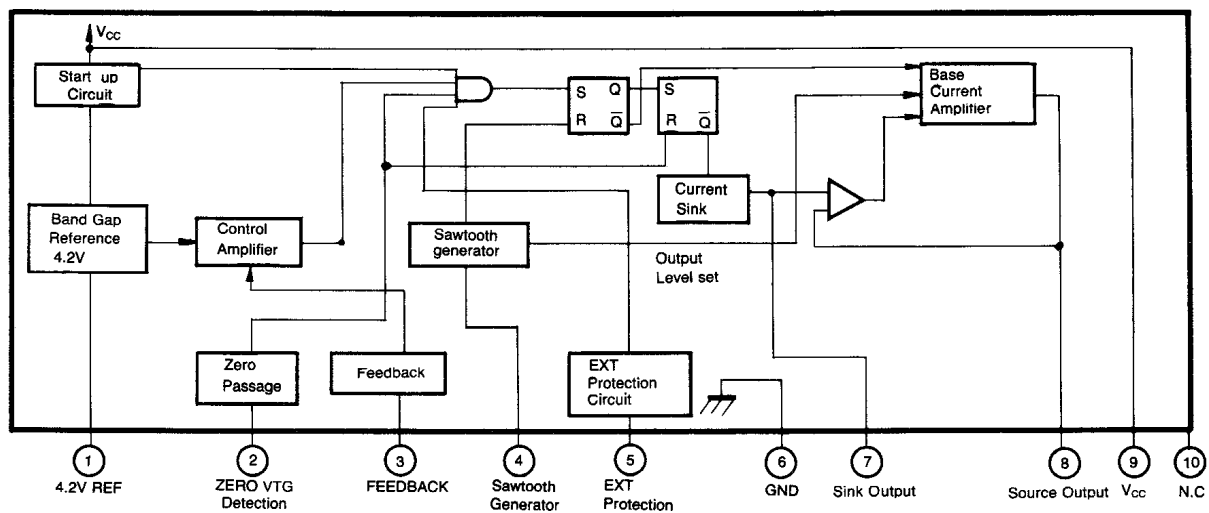
- Wide Operating Range
- Under Voltage Lockout
- Direct Switching TR Drive
- Low Start-Up Current

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.



Internal Block Diagram



Absolute Maximum Ratings (TA=25°C)

Parameter	Symbol	Value	Unit
Supply Voltage	VCC	20	V
Reference Output Voltage	VREF	6	V
Zero Passage Identification Voltage	V2	± 0.6	V
Control Amplifier Voltage	V3	3	V
Collector Current Simulation Voltage	V4	8	V
Blocking Input Voltage	V5	8	V
Base Current Cut-Off Point Voltage	V7	V9	V
Base Current Amplifier Output Voltage	V8	V9	V
Collector Current Simulation Current	I4	5	mA
Blocking Input Current	I5	5	mA
Base Current Cut-Off Point Current	I7	1.5	A
Base Current Amplifier Output Current	I8	-1.5	A
Operating Temperature Range	TA	0 ~ +70	°C

Electrical Characteristics

(TA = 25°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage	VCC	-	-	15	18	V
Start Operation						
Supply Current (1) (2) (3)	ICC1	V9 = 2V	-	-	0.5	mA
	ICC2	V9 = 5V	-	1.5	2.0	mA
	ICC3	V9 = 10V	-	2.4	3.2	mA
Switch On V1	V9	-	11.0	11.8	12.3	V

Electrical Characteristics

($T_A = +25^\circ\text{C}$, unless otherwise specified)

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

Note :

* After Switch-On

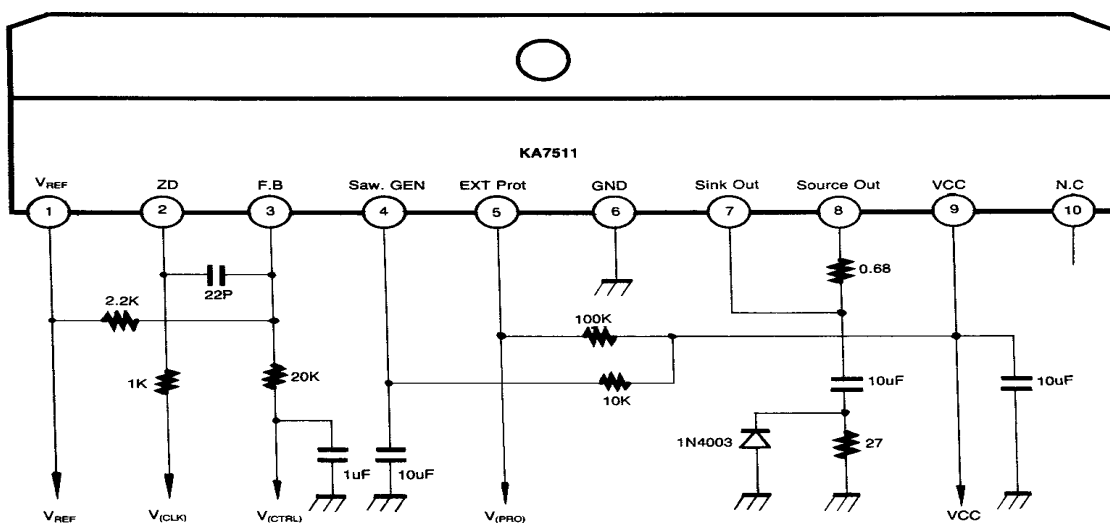


Figure 1. Test Circuit

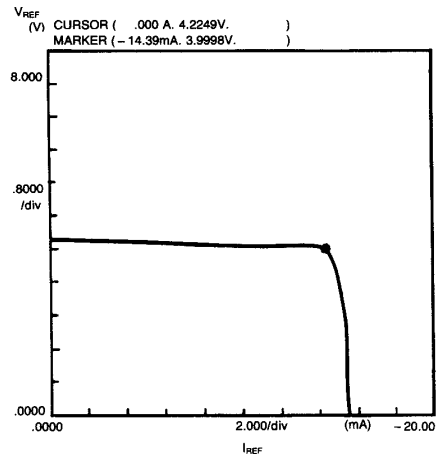


Figure 2. VREF Vs IREF (TA=25°C)

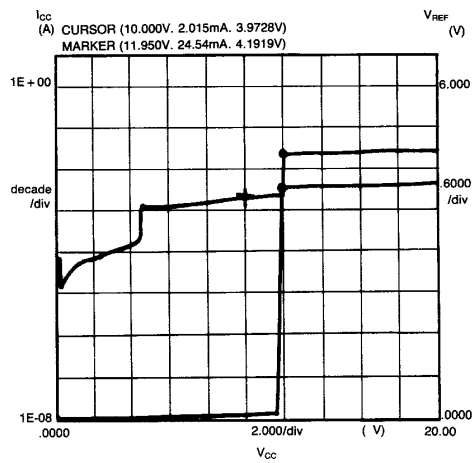


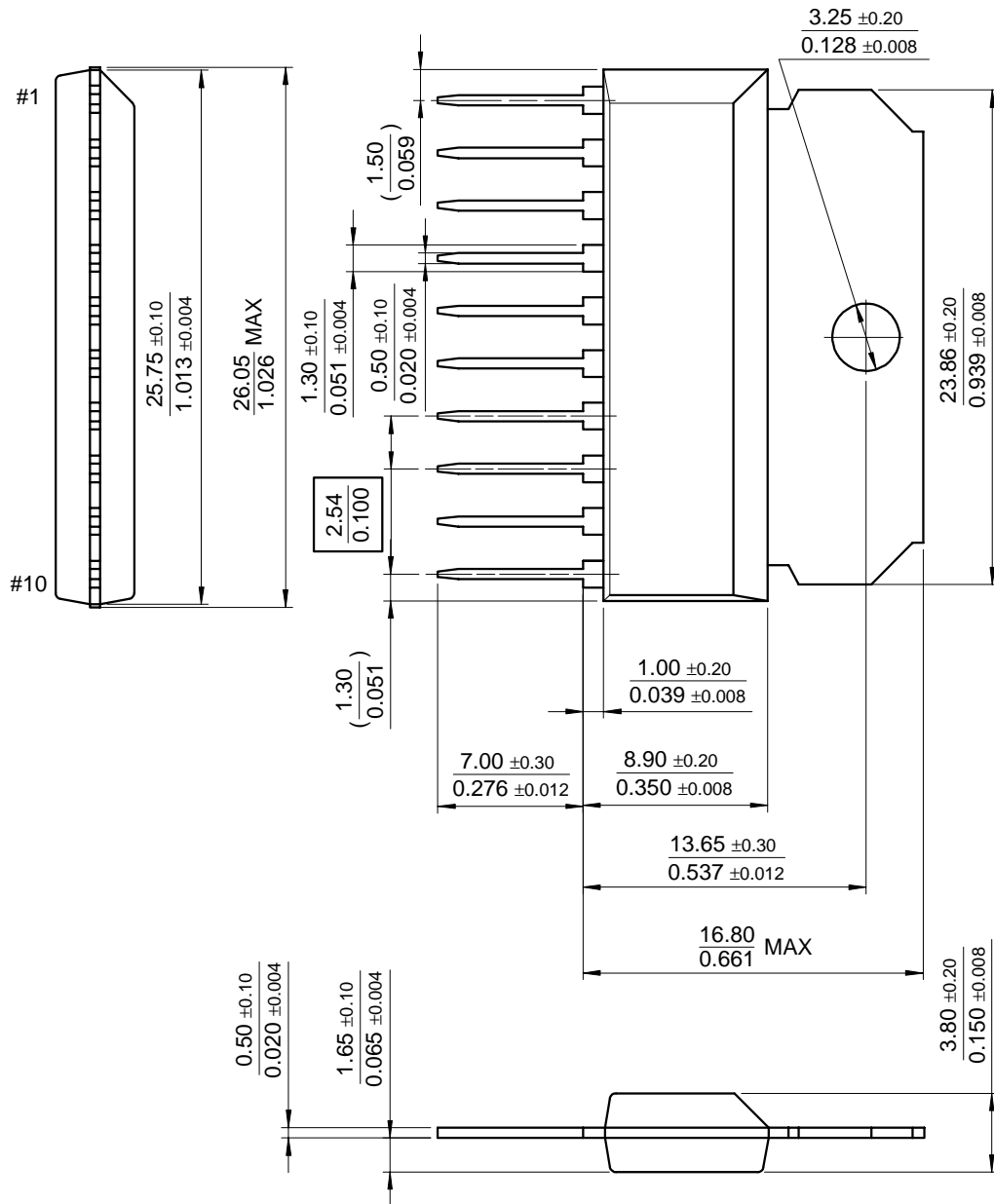
Figure 3. ICC Vs VREF (TA=25°C)

Mechanical Dimensions

Package

Dimensions in millimeters

10-SIP H/S



Ordering Information

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

DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR INTERNATIONAL. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.