

# KA7511

# SMPS CONTROLLER

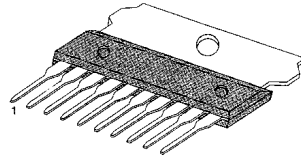
## CONTROL IC FOR SMPS

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.

## FEATURES

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

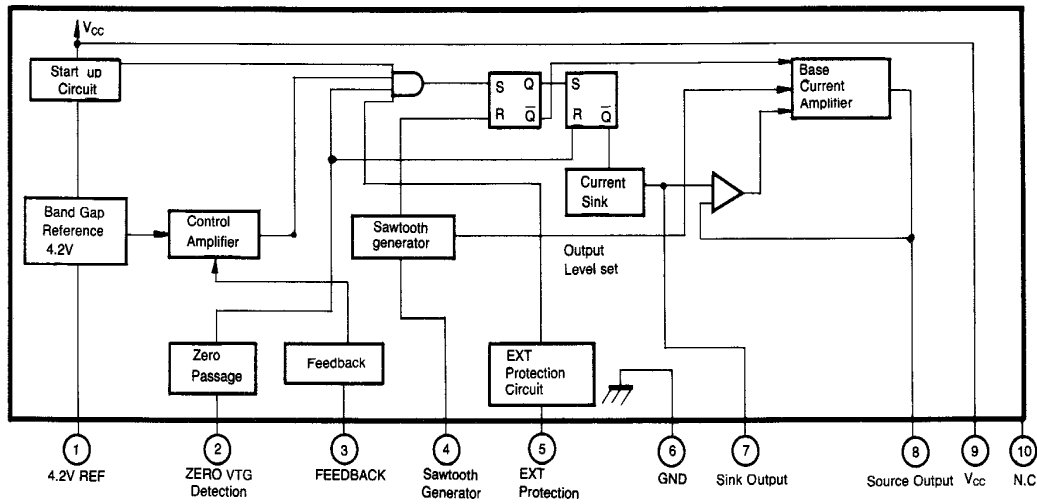
10 SIP H/S



## ORDERING INFORMATION

Device	Package	Operating temperature
KA7511	10 SIP	0 ~ +70°C

## BLOCK DIAGRAM



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

Characteristic	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	20	V
Reference Output Voltage	$V_{REF}$	6	V
Zero Passage Identification Voltage	$V_2$	$\pm 0.6$	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	$^\circ\text{C}$

**ELECTRICAL CHARACTERISTICS**(T<sub>A</sub> = 25 °C, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	$V_{CC}$		-	15	18	V
<b>Start Operation</b>						
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<sub>A</sub> = + 25 °C, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>* Normal Operation (V<sub>CC</sub> = 10V, V<sub>(CTRL)</sub> = -10V, V<sub>(CLK)</sub> = ± 0.5V, f = 20KHz, D = 0.5)</b>						
Supply Current ④ ⑤	I <sub>CC4</sub>	V <sub>(CTRL)</sub> = -10V	110	135	160	mA
	I <sub>CC5</sub>	V <sub>(CTRL)</sub> = 0V	50	75	100	mA
Reference Voltage ① ②	V <sub>REF1</sub>	I <sub>1</sub> < 0.1mA	4.0	4.2	4.5	V
	V <sub>REF2</sub>	I <sub>1</sub> = 5mA	4.0	4.2	4.4	V
Temperature Coefficient Of V <sub>REF</sub>	Δ V <sub>REF</sub> /Δ T			0.1		%
Control Voltage	V <sub>3</sub>	V <sub>(CTRL)</sub> = 0V	2.3	2.6	2.9	V
Collector Current Simulation Voltage	V <sub>4</sub>	V <sub>(CTRL)</sub> = 0V	1.8	2.2	2.5	V
	Δ V <sub>4</sub>	V <sub>(CTRL)</sub> = 0 ~ -10V	0.3	0.4	0.5	V
Clamping Voltage	V <sub>5</sub>		6	7	8	V
Output Voltage	V <sub>7</sub>	V <sub>(CTRL)</sub> = 0V	2.7	3.3	4.0	V
	V <sub>8</sub>	V <sub>(CTRL)</sub> = 0V	2.7	3.4	4.0	V
	Δ V <sub>8</sub>	V <sub>(CTRL)</sub> = 0 ~ -10V	1.6	2.0	2.4	V
Feedback Voltage	V <sub>2</sub>			0.2		V
<b>Protective Operation (V<sub>CC</sub> = 10V, V<sub>(CTRL)</sub> = -10V, V<sub>(CLK)</sub> = ± 0.5V, f = 20KHz, D = 0.5)</b>						
Supply Current ⑥	I <sub>CC6</sub>	V <sub>5</sub> < 1.9V	14	22	28	mA
Switch-Off Voltage ① ②	V <sub>7(OFF)</sub>	V <sub>5</sub> < 1.9V	1.3	1.5	1.8	V
	V <sub>4(OFF)</sub>	V <sub>5</sub> < 1.9V	1.8	2.1	2.5	V
Blocking Input Voltage	V <sub>5(B)</sub>	V <sub>(CTRL)</sub> = 0V	$\frac{V_1}{2} - 0.1$	$\frac{V_1}{2}$		V
V <sub>8</sub> Off Voltage	V <sub>9(OFF)</sub>	V <sub>(CTRL)</sub> = 0V	6.7	7.4	7.8	V
V <sub>1</sub> Off Voltage	Δ V <sub>9(OFF)</sub>	V <sub>(CTRL)</sub> = 0V	0.3	0.6	1	V

(Note) \* After Switch-On

Fig. 1. TEST CIRCUIT

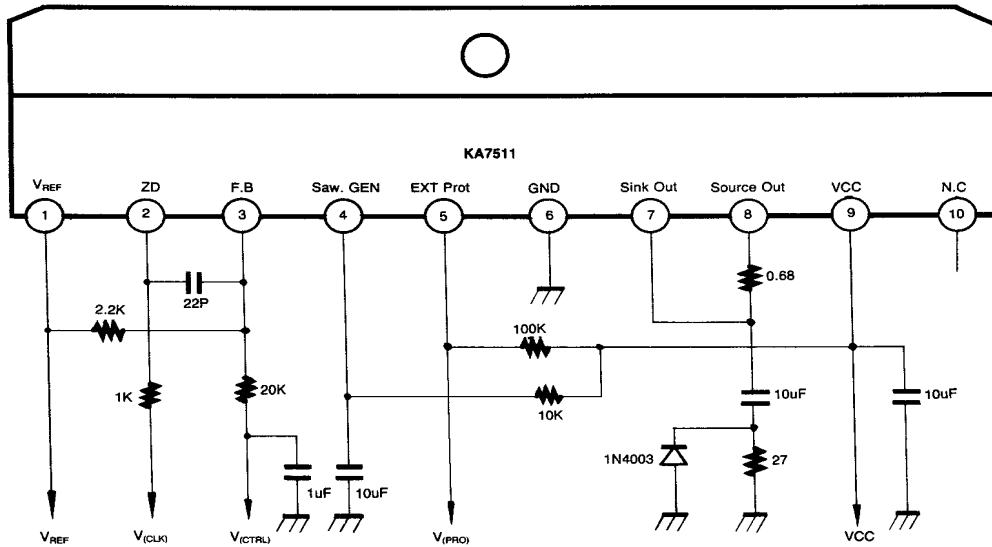


Fig. 2.  $V_{REF}$  Vs  $I_{REF}$  ( $T_A=25^\circ C$ )

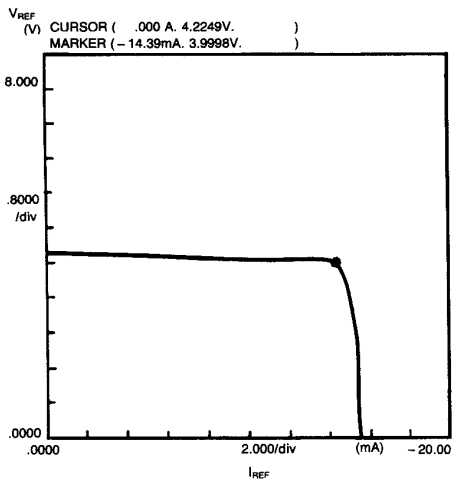
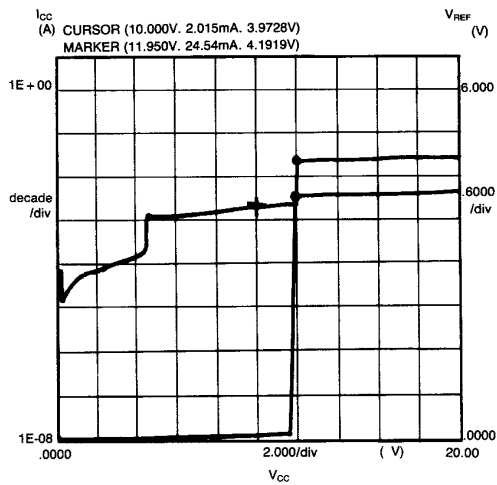
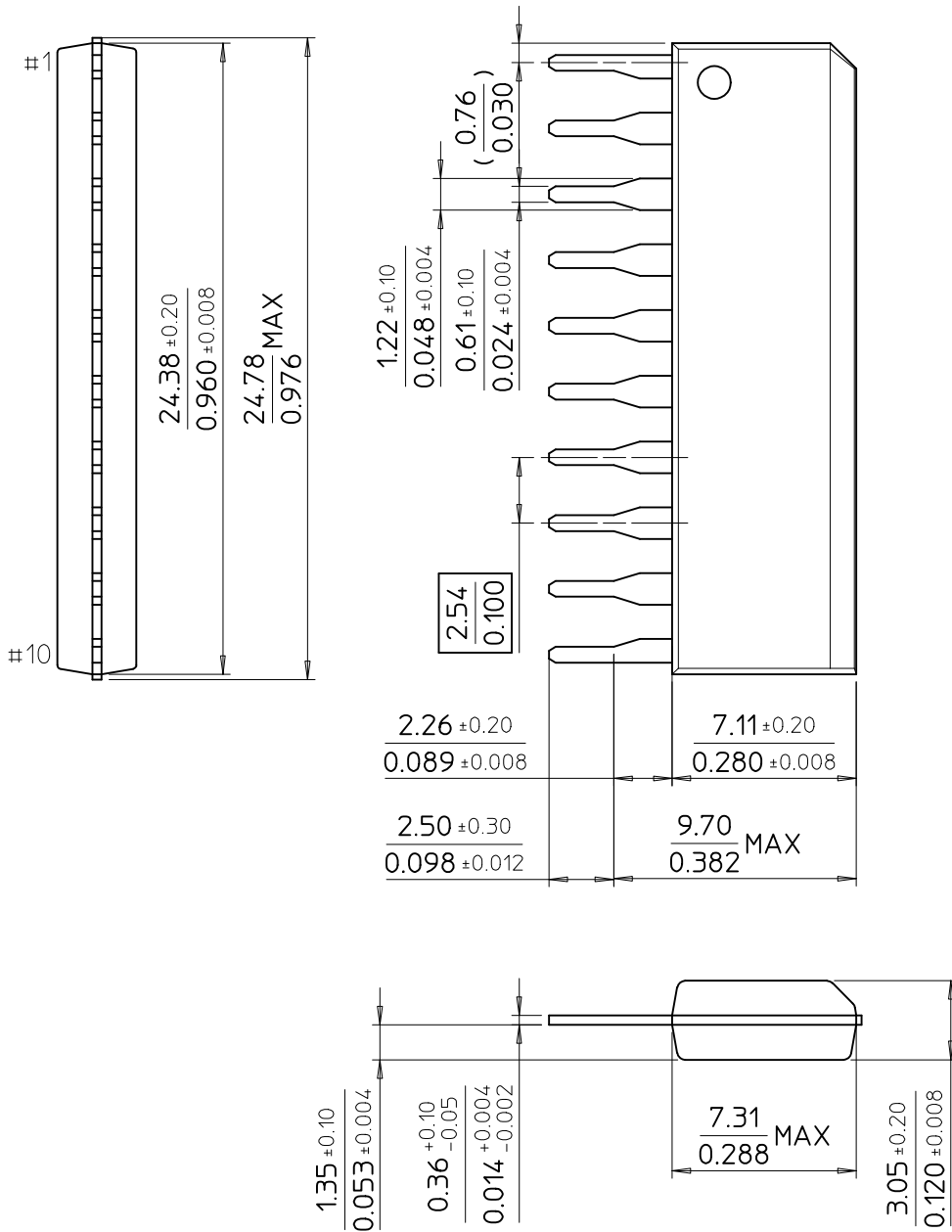


Fig. 3.  $I_{CC}$  Vs  $V_{REF}$  ( $T_A=25^\circ C$ )



# 10-SIP

Dimensions in Millimeters/Inches



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