KA7515

SMPS Controller

Features

- Good load regulation over a wide load for external components.
- Internal soft-start for quiet start-up.
- Start-up supply current less than 1.6mA.
- Switch-oft supply current less than 10mA.
- Burst operation under short-circuit conditions
- Thermal shutdown through over-temperature.

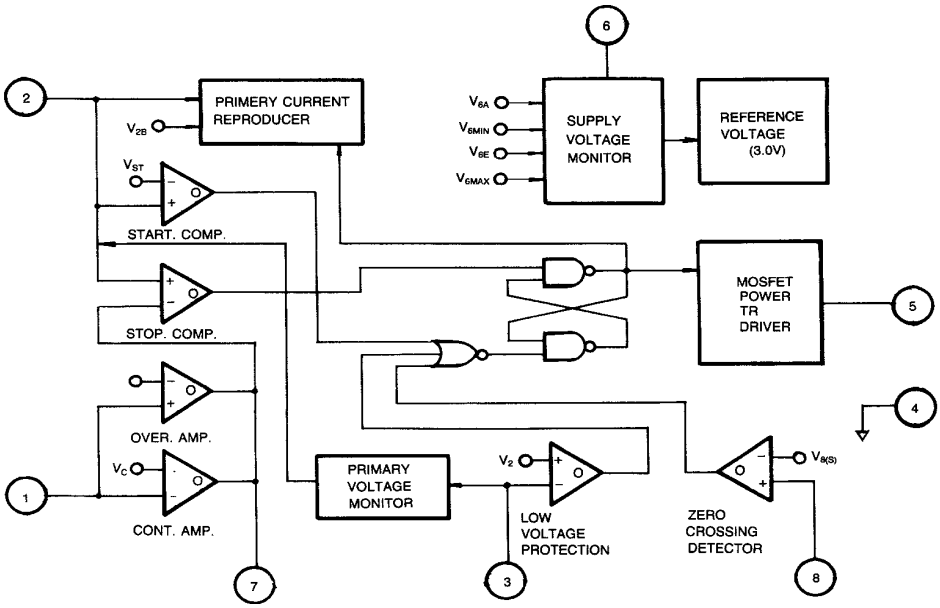
Description

The KA7515 provides the necessary features to implement switching mode power supply with a minimal external parts count. Internally implemented circuits include 3V reference voltage block, supply voltage monitoring block to control output through supply voltage and overload amplifier block to control output by external road variation. The KA7515 controls the power MOSFET and performs all necessary regulation and monitoring function in free running flyback converters.

8-DIP

1

Internal Block Diagram



Rev. 5.0

Absolute Maximum Ratings (T_A=25°C)

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	20	V
Collector Supply Voltage	V_C	13	V
Output current, Sink or Source	I_O	12	mA
Operating Temperature	T_{OPR}	-25 ~ + 85	°C
Storage Temperature	T_{STG}	-65 ~ + 150	°C

Electrical Characteristics (T_A = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Start-up Hysteresis						
Start-up Current (1)	$I_{ST}1$	V_6 = 5V	-	0.5	0.75	mA
Start-up Current (2)	$I_{ST}2$	V_6 = 8V	-	1.0	1.5	mA
Start-up Current (3)	$I_{ST}3$	$V_6 = V_{6E}$	-	1.1	1.6	mA
Switch On Voltage	V_{6E}	$V_1 = V_4 = V_8$ = GND	11	12	13	V
Switch Off Voltage	V_{6A}	$V_1 = V_4 = V_8$ = GND	6	6.5	7	V
Switch On Current	I_{6E}	$V_1 = V_4 = V_8$ = GND	-	9.0	12.0	mA
Switch Off Current	I_{6A}	$V_1 = V_4 = V_8$ = GND	-	8.0	10.0	mA
Voltage Limiter (Pin 2)	$V_{2(MAX)}$	V_6 = 10V (IC Switch-Off)	5.8	6.8	7.8	V
Voltage Limiter (Pin 3)	$V_{3(MAX)}$	V_6 = 10V (IC Switch-Off)	5.8	6.8	7.8	V
Control Input Voltage	$V_{I(CTRL)}$	V_6 = 10V (IC Switch-On)	370	400	430	mV
Gain In Control Range	$G_{V(CTRL)}$	V_6 = 10V (IC Switch-On)	48	51	54	dB
Basic Value	V_{2B}	V_6 = 10V (IC Switch-On)	0.9	1.0	1.15	V
Maximum Peak Value	$V_{2(MAX)}$	V_6 = 10V (IC Switch-On)	2.8	3.0	3.4	V
Overload Range Upper Limit	V_{IH}	V_6 = 10V (IC Switch-On)	370	400	430	mV
Overload Range Lower Limit	V_{IL}	V_6 = 10V (IC Switch-On)	60	200	290	mV
Gain In Overload Range	$G_{V(OVER)}$	V_6 = 10V (IC Switch-On)	1	2	3	dB
Input Current	I_1	V_6 = 10V (IC Switch-On)	90	140	180	µA
In Short-Circuit Operation						
Peak Value (1)	$V_{2(PK)}1$	V_1 = 3.5V	2.8	3.0	3.4	V
Peak Value (2)	$V_{2(PK)}2$	V_1 = 0V	2.35	2.65	2.95	V
Output Pulse Width	t_W1	V_1 = 3.5V	3.5	5	6.5	µs
Output Pulse Width	t_W2	V_1 = 0V	2.5	4	5.5	µs
Current Consumption (1)	$I_{6}1$	V_1 = 3.5V	-	12	15	mA
Current Consumption (2)	$I_{6}2$	V_1 = 0V	-	12	15	mA
Overload Point	$-I_2$	$V_3 = V_4$, V_2 = 0V	400	660	850	µA

Electrical Characteristics (T_A = 25°C) (Continued)

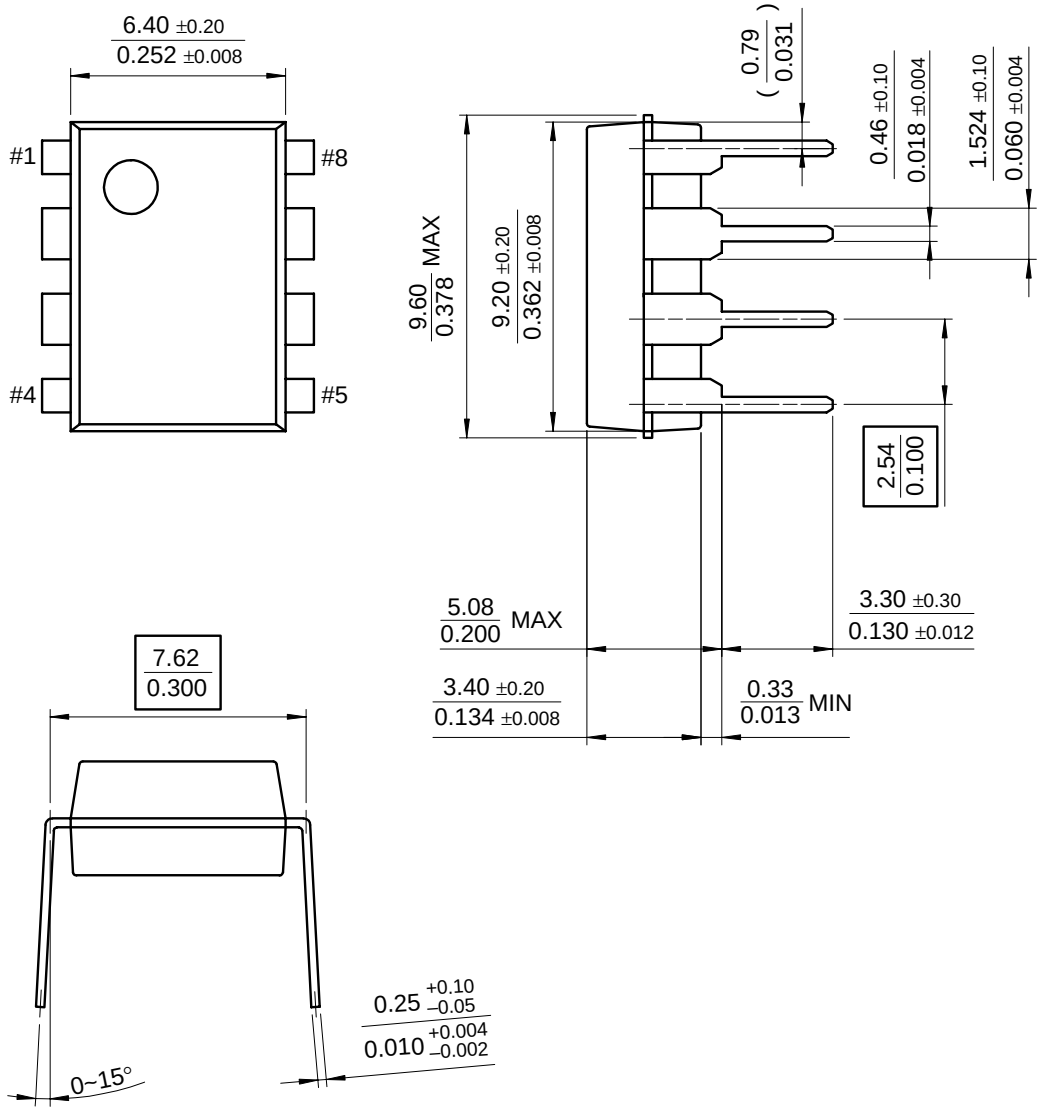
Correction Current						
Positive Value	$V_{8(P)}$	I_8 = 1mA	0.7	0.75	0.8	V
Negative Value	$V_{8(N)}$	I_8 = -1mA	0.15	0.22	0.25	V
Threshold Value	$V_{8(S)}$	-	40	50	60	mV
Delay Time	t_D	-	-	0.4	0.7	µs
Saturation Voltage (1)	$V_{SAT}1$	I_5 = -1.0A	-	2.5	3.0	V
Saturation Voltage (2)	$V_{SAT}2$	I_5 = 1.0A	-	2.5	3.0	V
Rising Edge	+dV5/dt	V_1 = 3.5V	4.0	50	-	V/µs
Falling Edge	-dV5/dt	V_1 = 3.5V	50	75	-	V/µs
Under VTG. Protection (1)	$\Delta V_{6(UV)}$	$V_{6MIN} = V_{6a} + \Delta V_6$	0.3	0.5	1	V
Over VTG. Protection	$V_{6(MAX)}$	-	14	15	16	V
Under VTG. Protection (2)	$V_{3(UV)}$	-	0.925	1	1.075	V
Overtemperature	T_J	-	150	175	200	°C
Protection						
Voltage Pin 3	V_3	I_3 = 1mA	-	0.35	0.5	V

Mechanical Dimensions

Package

Dimensions in millimeters

8-DIP



Ordering Information

Product Number	Package	Operating Temperature
KA7515	8-DIP	-25 ~ + 85°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.

9/25/00 0.0m 001
Stock#DSxxxxxxxx