

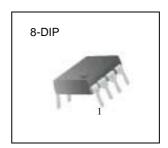
# KA7515 SMPS Controller

### **Features**

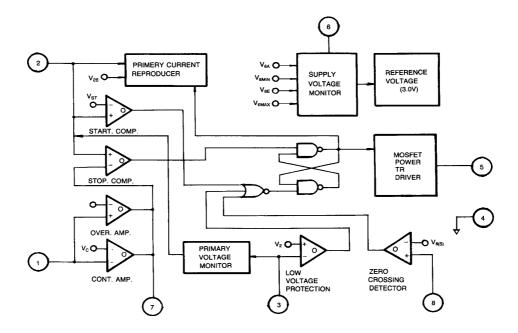
- Good load regulation over a wide load for external components.
- · Internal soft-start for quiet start-up.
- Start-up supply current less than 1.6mA.
- Switch-oft supply current less than 10mA.
- Burst operation under short-circuit conditions
- Thermal shutdown through over-temperature.

### **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.



### **Internal Block Diagram**



## Absolute Maximum Ratings (TA=25°C)

Parameter	Symbol	Value	Unit
Supply Voltage	Vcc	20	V
Collector Supply Voltage	Vc	13	V
Output current, Sink or Source	lo	12	mA
Operating Temperature	TOPR	-25 ~ + 85	°C
Storage Temperature	TSTG	-65 ~ + 150	°C

## Electrical Characteristics (T<sub>A</sub> = 25°C)

Parameter	Symbol	Conditions	Min.	Тур.	Max.	Unit
Start-up Hysteresis			•	•	•	
Start-up Current (1)	IST1	V <sub>6</sub> = 5V	-	0.5	0.75	mA
Start-up Current (2)	IST2	V <sub>6</sub> = 8V	-	1.0	1.5	mA
Start-up Current (3)	IST3	V6 = V6E	-	1.1	1.6	mA
Switch On Voltage	V6E	V1 = V4 = V8 = GND	11	12	13	V
Switch Off Voltage	V6A	V1 = V4 = V8 = GND	6	6.5	7	V
Switch On Current	l6E	V1 = V4 = V8 = GND	-	9.0	12.0	mA
Switch Off Current	I <sub>6</sub> A	V <sub>1</sub> = V <sub>4</sub> = V <sub>8</sub> = GND	-	8.0	10.0	mA
Voltage Limiter (Pin 2)	V2(MAX)	V <sub>6</sub> = 10V (IC Switch-Off)	5.8	6.8	7.8	V
Voltage Limiter (Pin 3)	V3(MAX)	V <sub>6</sub> = 10V (IC Switch-Off)	5.8	6.8	7.8	V
Control Input Voltage	VI(CTRL)	V <sub>6</sub> = 10V (IC Switch-On)	370	400	430	mV
Gain In Control Range	GV(CTRL)	V <sub>6</sub> = 10V (IC Switch-On)	48	51	54	dB
Basic Value	V2B	V <sub>6</sub> = 10V (IC Switch-On)	0.9	1.0	1.15	V
Maximum Peak Value	V <sub>2</sub> (MAX)	V <sub>6</sub> = 10V (IC Switch-On)	2.8	3.0	3.4	V
Overload Range Upper Limit	VIH	V <sub>6</sub> = 10V (IC Switch-On)	370	400	430	mV
Overload Range Lower Limit	VIL	V <sub>6</sub> = 10V (IC Switch-On)	60	200	290	mV
Gain In Overload Range	GV(OVER)	V <sub>6</sub> = 10V (IC Switch-On)	1	2	3	dB
Input Current	l1	V <sub>6</sub> = 10V (IC Switch-On)	90	140	180	μΑ
In Short-Circuit Operation						
Peak Value (1)	V2(PK)1	V1 = 3.5V	2.8	3.0	3.4	V
Peak Value (2)	V <sub>2</sub> (PK) <sup>2</sup>	V <sub>1</sub> = 0V	2.35	2.65	2.95	V
Output Pulse Width	tW1	V1 = 3.5V	3.5	5	6.5	μs
Output Pulse Width	tw2	V <sub>1</sub> = 0V	2.5	4	5.5	μs
Current Consumption (1)	l61	V1 = 3.5V	-	12	15	mA
Current Consumption (2)	l <sub>6</sub> 2	V <sub>1</sub> = 0V	-	12	15	mA
Overload Point	-l <sub>2</sub>	V <sub>3</sub> = V <sub>4</sub> , V <sub>2</sub> = 0V	400	660	850	μΑ

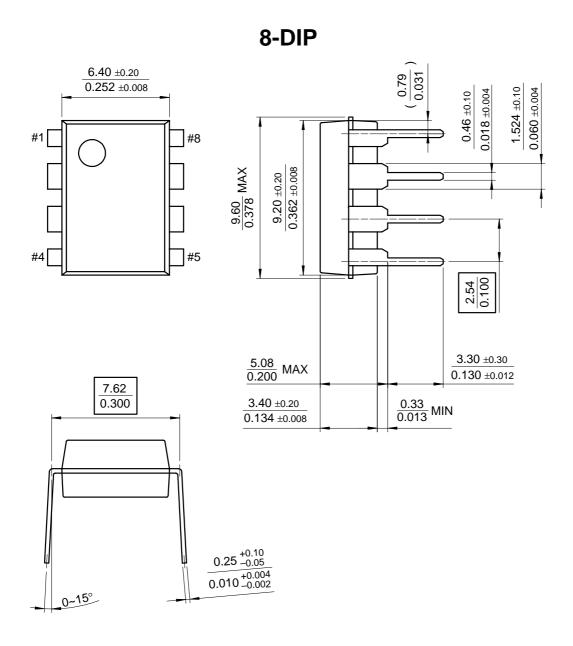
# Electrical Characteristics (T<sub>A</sub> = 25°C) (Continued)

Correction Current						
Positive Value	V8(P)	I8 = 1mA	0.7	0.75	0.8	V
Negative Value	V8(N)	I8 = -1mA	0.15	0.22	0.25	V
Threshold Value	V8(S)	-	40	50	60	mV
Delay Time	tD	-	-	0.4	0.7	μs
Saturation Voltage (1)	Vsat1	I <sub>5</sub> = -1.0A	-	2.5	3.0	V
Saturation Voltage (2)	VSAT2	I5 = 1.0A	-	2.5	3.0	V
Rising Edge	+dV5/dt	V <sub>1</sub> = 3.5V	4.0	50	-	V/μs
Falling Edge	-dV5/dt	V <sub>1</sub> = 3.5V	50	75	-	V/μs
Under VTG. Protection (1)	ΔV6(UV)	$V_{6MIN} = V_{6a} + \Delta V_{6}$	0.3	0.5	1	V
Over VTG. Protection	V <sub>6</sub> (MAX)	-	14	15	16	V
Under VTG. Protection (2)	V3(UV)	-	0.925	1	1.075	V
Overtemperature	TJ	-	150	175	200	°C
Protection						
Voltage Pin 3	V <sub>3</sub>	I3 = 1mA	-	0.35	0.5	V

### **Mechanical Dimensions**

### Package

#### **Dimensions in millimeters**



## **Ordering Information**

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

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