



Is Now Part of



ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note. As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

ON Semiconductor and the ON Semiconductor logo are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

KA3525A

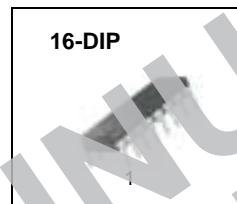
SMPS Controller

Features

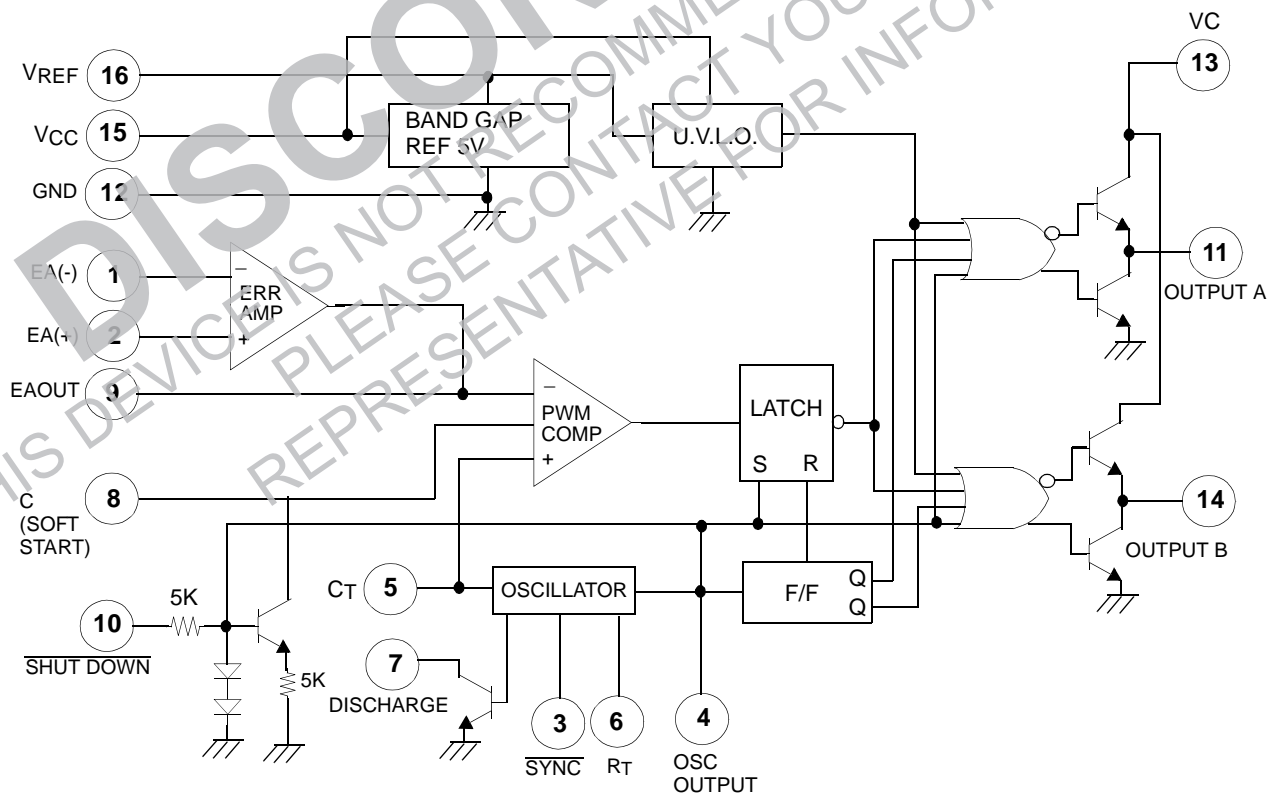
- 5V $\pm 1\%$ Reference
- Oscillator Sync Terminal
- Internal Soft Start
- Deadtime Control
- Under Voltage Lockout

Description

The KA3525A is a monolithic integrated circuit that includes all of the control circuits necessary for a pulse width modulating regulator. There are a voltage reference, an error amplifier, a pulse width modulator, an oscillator, an under voltage lockout, a soft start circuit, and the output driver in the chip.



Internal Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	40	V
Collector Supply Voltage	V _C	40	V
Output Current, Sink or Source	I _O	500	mA
Reference Output Current	I _{REF}	50	mA
Oscillator Charging Current	I _{CHG(OSC)}	5	mA
Power Dissipation (T _A = 25°C)	P _D	1000	mW
Operating Temperature	T _{OPR}	0 ~ +70	°C
Storage Temperature	T _{STG}	-65 ~ +150	°C
Lead Temperature (Soldering, 10sec)	T _{LEAD}	+300	°C

Electrical Characteristics

(V_{CC} = 20V, T_A = 0 to +70°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
REFERENCE SECTION						
Reference Output Voltage	V _{REF}	T _J = 25°C	5.0	5.1	5.2	V
Line Regulation	ΔV _{REF}	V _{CC} = 8 to 35V	-	9	20	mV
Load Regulation	ΔV _{REF}	I _{REF} = 0 to 20mA	-	20	50	mV
Short Circuit Output Current	I _{SC}	V _{REF} = 0, T _J = 25°C	-	80	100	mA
Total Output Variation (Note1)	ΔV _{REF}	Line, Load and Temperature	4.95	-	5.25	V
Temperature Stability (Note1)	ST _T	-	-	20	50	mV
Long Term Stability (Note1)	ST	T _J = 125°C, 1KHS	-	20	50	mV
OSCILLATOR SECTION						
Initial Accuracy (Note1, 2)	ACCUR	T _J = 25°C	-	±3	±6	%
Frequency Change With Voltage	Δf/ΔV _{CC}	V _{CC} = 8 to 35V (Note1, 2)	-	±0.8	±2	%
Maximum Frequency	f(MAX)	R _T = 2kΩ, C _T = 470pF	400	430	-	kHz
Minimum Frequency	f(MIN)	R _T = 200kΩ, C _T = 0.1uF	-	60	120	Hz
Clock Amplitude (Note1, 2)	V(CLK)	-	3	4	-	V
Clock Width (Note1, 2)	t _{W(CLK)}	T _J = 25°C	0.3	0.6	1	μs
Sync Threshold	V _{TH(SYNC)}	-	1.2	2	2.8	V
Sync Input Current	I _{I(SYNC)}	Sync = 3.5V	-	1.3	2.5	mA

Electrical Characteristics (Continued)

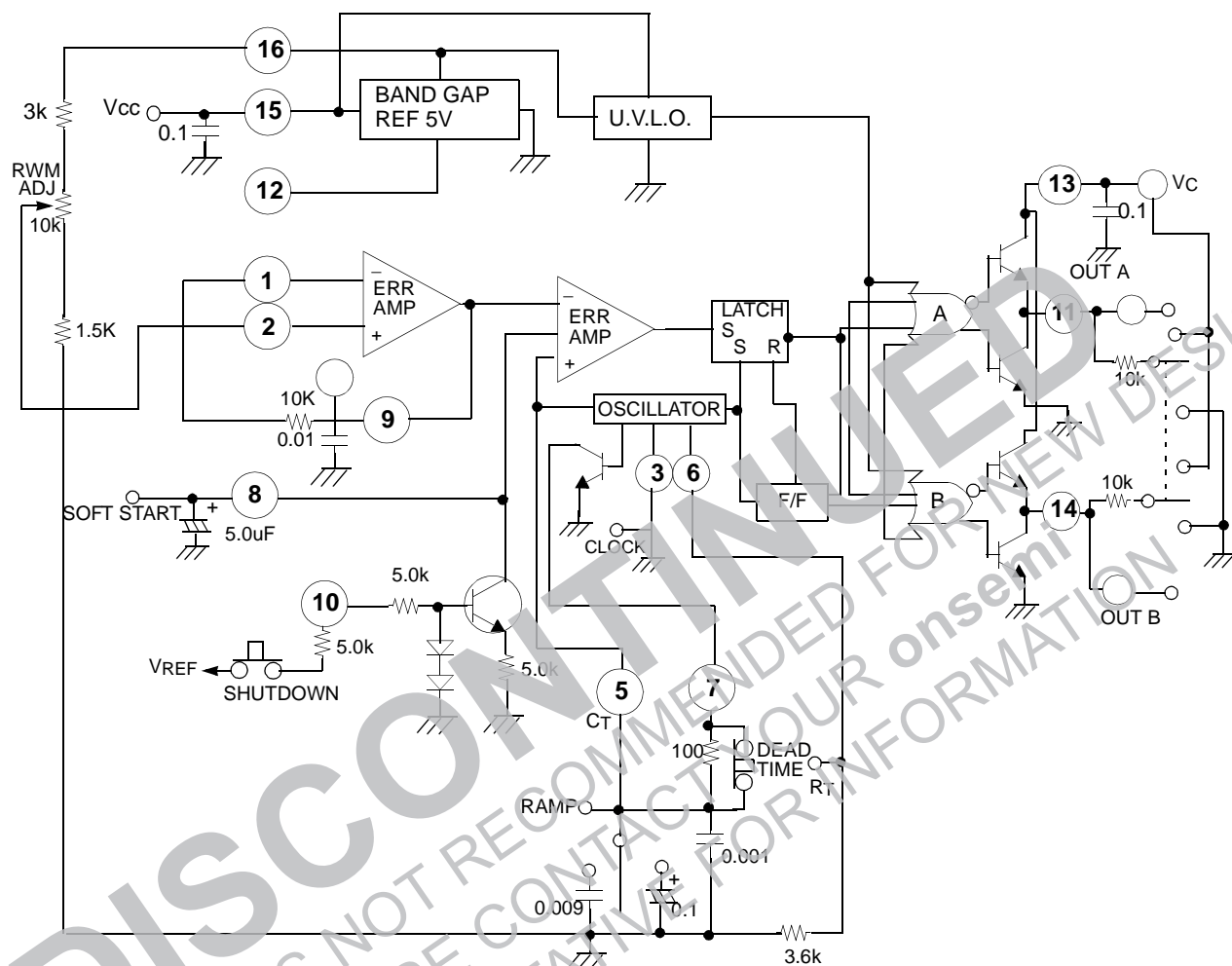
(VCC = 20V, TA = 0 to +70°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
ERROR AMPLIFIER SECTION (VCM = 5.1V)						
Input Offset Voltage	VIO	-	-	1.5	10	mV
Input Bias Current	IBIAS	-	-	1	10	μA
Input Offset Current	IIO	-	-	0.1	1	μA
Open Loop Voltage Gain	GVO	RL ≥ 10MΩ	60	80	-	dB
Common Mode Rejection Ratio	CMRR	VCM = 1.5 to 5.2V	60	90	-	dB
Power Supply Rejection Ratio	PSRR	VCC = 8 to 3.5V	50	60	-	dB
PWM COMPARATOR SECTION						
Minimum Duty Cycle	D(MIN)	-	-	-	0	%
Maximum Duty Cycle	D(MAX)	-	45	49	-	%
Input Threshold Voltage (Note2)	VTH1	Zero Duty Cycle	0.7	0.9	-	V
Input Threshold Voltage (Note2)	VTH2	Max Duty Cycle	-	3.2	3.6	V
SOFT-START SECTION						
Soft Start Current	ISOFT	VSD = 0V, VSS = 0V	25	51	80	μA
Soft Start Low Level Voltage	VSL	VSD = 25V	-	0.3	0.7	V
Shutdown Threshold Voltage	VTH(SD)	-	0.9	1.3	1.7	V
Shutdown Input Current	IN(SD)	VSD = 2.5V	-	0.3	1	mA
OUTPUT SECTION						
Low Output Voltage I	VOL I	ISINK = 20mA	-	0.1	0.4	V
Low Output Voltage II	VOL II	ISINK = 100mA	-	0.05	2	V
High Output Voltage I	VCH I	ISOURCE = 20mA	18	19	-	V
High Output Voltage II	VCH II	ISOURCE = 100mA	17	18	-	V
Under Voltage Lockout	VUV	V8 and V9 = High	6	7	8	V
Collector Leakage Current	ILKG	VCC = 35V	-	80	200	μA
Rise Time (Note1)	tR	CL = 1μF, TJ = 25°C	-	80	600	ns
Fall Time (Note1)	tF	CL = 1μF, TJ = 25°C	-	70	300	ns
STANDBY CURRENT						
Supply Current	ICC	VCC = 35V	-	12	20	mA

Note :

- These parameters, although guaranteed over the recommended operating conditions, are not 100% tested in production
- Tested at fOSC=40kHz (RT = 3.6K, CT = 0.01μF, RI = 0Ω)

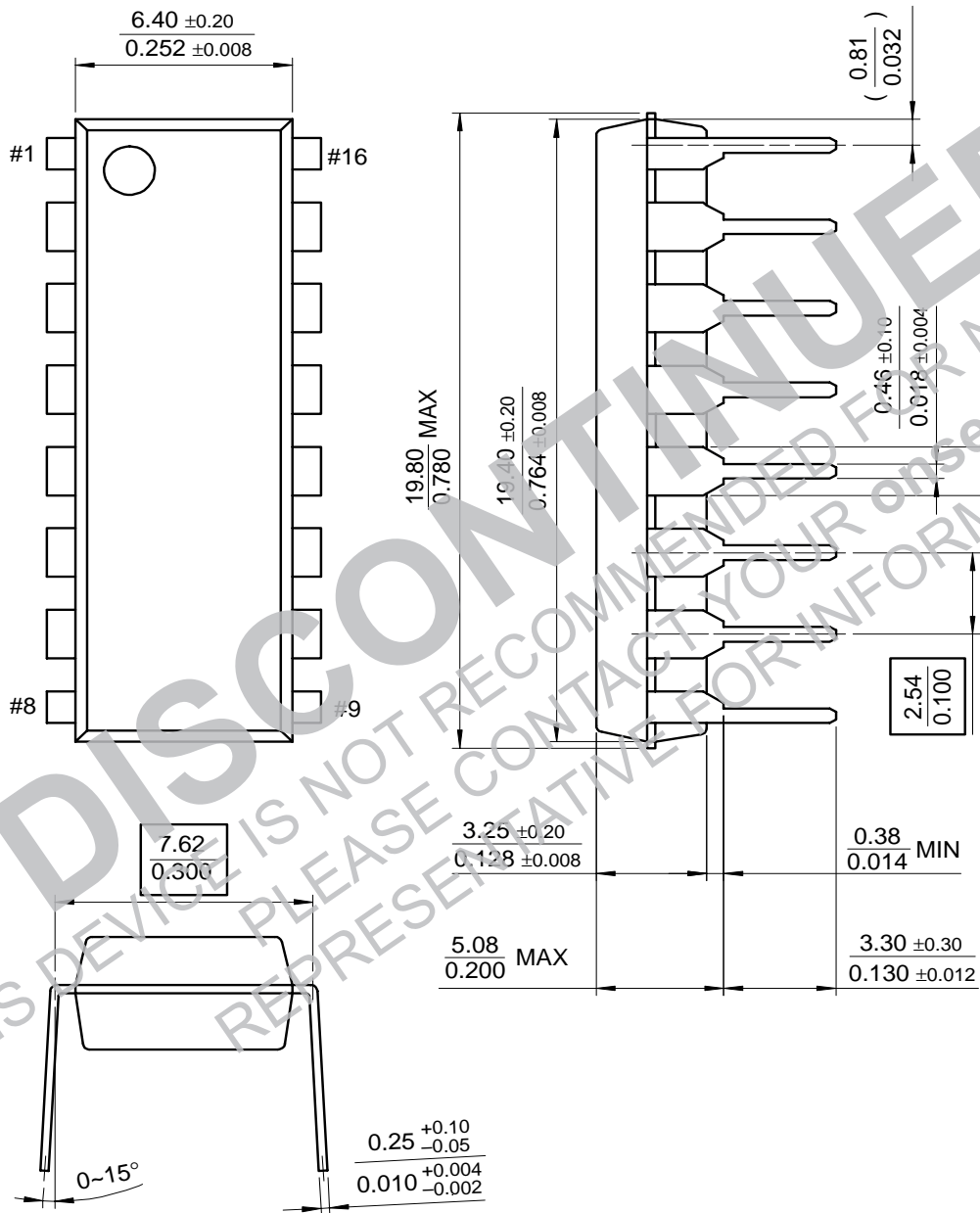
Test Circuit



Mechanical Dimensions

Package

16-DIP



Ordering Information

Product Number	Package	Operating Temperature
KA3525A	16-DIP	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 CORPORATION. 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.

DISCONTINUED
THIS DEVICE IS NOT RECOMMENDED FOR NEW DESIGN
PLEASE CONTACT YOUR onsemi
REPRESENTATIVE FOR INFORMATION

ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303-675-2175 or 800-344-3860 Toll Free USA/Canada
Fax: 303-675-2176 or 800-344-3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800-282-9855 Toll Free
USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81-3-5817-1050

ON Semiconductor Website: www.onsemi.com

Order Literature: <http://www.onsemi.com/orderlit>

For additional information, please contact your local
Sales Representative

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[onsemi:](#)

[KA3525A](#)