

Not Recommended for New Designs



AP1624

PWM/PFM DUAL MODE STEP-UP DC/DC CONTROLLER

Features

- Input Voltage Range: 0.9~6V
- PWM/PFM Switching Control
- High Efficiency: 90%
- Oscillator Frequency: 300kHz (±15%)
- Stand-by Current: $I_{STB} = 3\mu A$ (Typ.)
- Lead Free Finish/RoHS Compliant for Lead Free products (Note 1)
- Lead Free Package: SOT25

General Description

The AP1624 is a multi-functional step-up DC/DC controller. Large output current is possible using an externally connected N channel MOSFET, coil, and diode.

Output voltage (V_{OUT}) is programmable with 1.23V of standard voltage supply internal, and using externally connected components, output voltage (FB) can be set up at will.

With a 300kHz switching frequency, the size of the external components can be reduced.

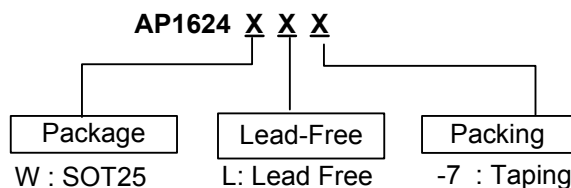
Control switches from PFM to PWM during light loads with the AP1624 (PFM/PWM switchable) and the series is highly efficient from light loads to large output currents.

During stand-by time (CE pin "Low"), current consumption is reduced to 3µA.

Applications

- Electronic Information Organizers
- Palmtops
- Cellular and Portable Phones
- Portable Audio Systems
- Various Multi-function Power Supplies

Ordering Information



Note: 1. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see *EU Directive Annex Notes 5 and 7*.

Device	Package Code	Packaging (Note 2)	7" Tape and Reel	
			Quantity	Part Number Suffix
AP1624W	W	SOT25	3000/Tape & Reel	-7

Note: 2. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

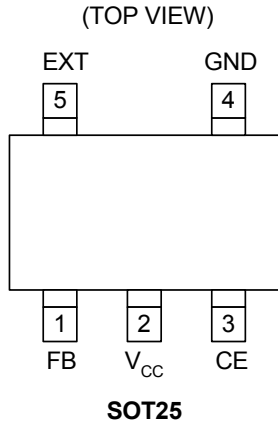
Not Recommended for New Designs



PWM/PFM DUAL MODE STEP-UP DC/DC CONTROLLER

AP1624

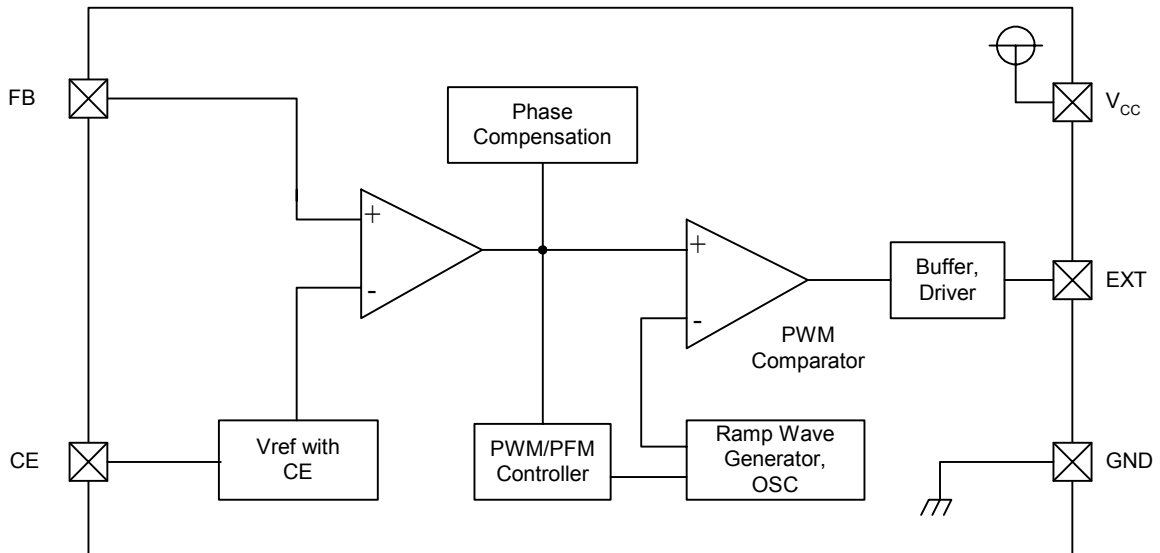
Pin Assignments



Pin Descriptions

Pin No.	Pin Name	Function
1	FB	Feedback Pin
2	V _{CC}	IC Power Supply Pin
3	CE	Chip Enable: H: Enable L: Disable
4	GND	GND Pin
5	EXT	External N-MOSFET Connection

Block Diagram



Not Recommended for New Designs

AP1624



PWM/PFM DUAL MODE STEP-UP DC/DC CONTROLLER

Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$

Parameter	Symbol	Ratings	Units
V_{IN} Pin Voltage	V_{CC}	-0.3 ~ 6.5	V
FB Pin Voltage	V_{FB}	-0.3 ~ $V_{CC} + 0.3$	V
CE Pin Voltage	V_{CE}	-0.3 ~ $V_{CC} + 0.3$	V
EXT Pin Voltage	V_{EXT}	-0.3 ~ $V_{CC} + 0.3$	V
EXT Pin Current	I_{EXT}	± 100	mA
Operating Junction Temperature	T_{OP}	-30 ~ +105	$^\circ\text{C}$
Storage Temperature	T_{ST}	-40 ~ +125	$^\circ\text{C}$

Electrical Characteristics

$V_{IN} = 3.3\text{V}$, $V_{OUT} = 5\text{V}$, Load = 300 mA

$T_A = 25^\circ\text{C}$

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
FB Voltage	V_{FB}		1.205	1.23	1.255	V
Maximum Input Voltage	V_{CC}		6	-	-	V
Supply Current 1	I_{CC1}	No external components, $CE = V_{IN}$, $V_{FB} = 1.5\text{V}$	-	50	100	μA
Supply Current 2	I_{CC2}	No external components, $CE = V_{IN}$, $V_{FB} = 0\text{V}$	-	100	200	μA
Stand-by Current	I_{STB}	No external components, $CE = 0\text{V}$, $V_{FB} = 0.5\text{V}$	-	3	-	μA
Oscillator Frequency	F_{OSC}		200	300	350	KHz
Maximum Duty Cycle	DC_{MAX}	No external components $V_{CC} = 5\text{V}$, $V_{FB} = 0\text{V}$	80	-	-	%
PFM Duty Cycle	DC_{PFM}	No load	15	25	35	%
CE "High" Voltage	V_{CEH}	Apply above 0.65Vcc (min.) to CE, Operating mode	0.65	-	-	*Vcc
CE "Low" Voltage	V_{CEL}	Apply under 0.2Vcc (min.) to CE, Standby mode	-	-	0.20	*Vcc
EXT Source Current	I_{SOURCE}	$V_{CE} = V_{IN}$, $V_{FB} = 0\text{V}$, $V_{EXT} = V_{CC} - 0.4\text{V}$	-	40	-	mA
EXT Sink Current	I_{SINK}	$V_{CE} = V_{IN}$, $V_{FB} = 2\text{V}$, $V_{EXT} = 0.4\text{V}$	-	70	-	mA
Efficiency	η		-	90	-	%

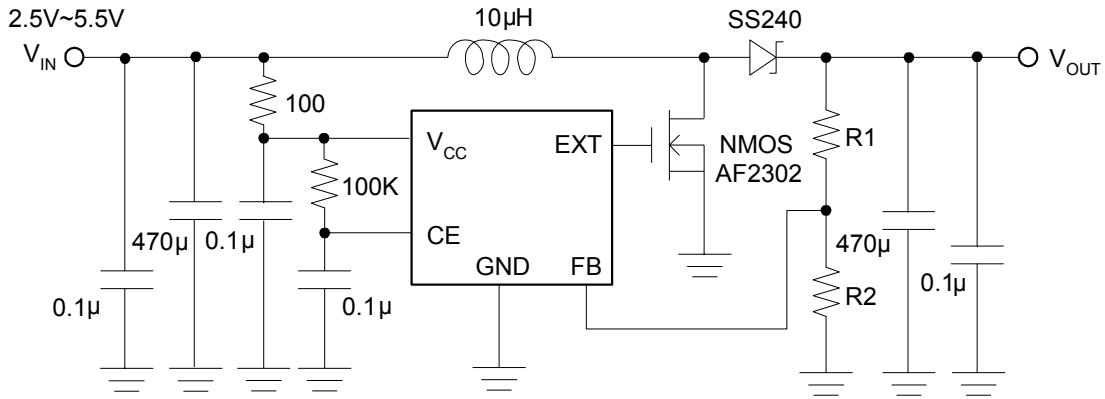
Not Recommended for New Designs



AP1624 PWM/PFM DUAL MODE STEP-UP DC/DC CONTROLLER

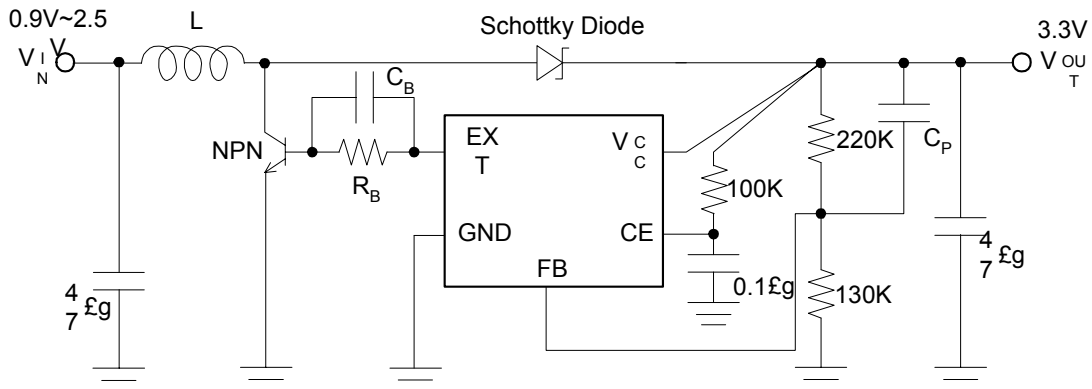
Typical Application Circuit

(1) Normal Circuit



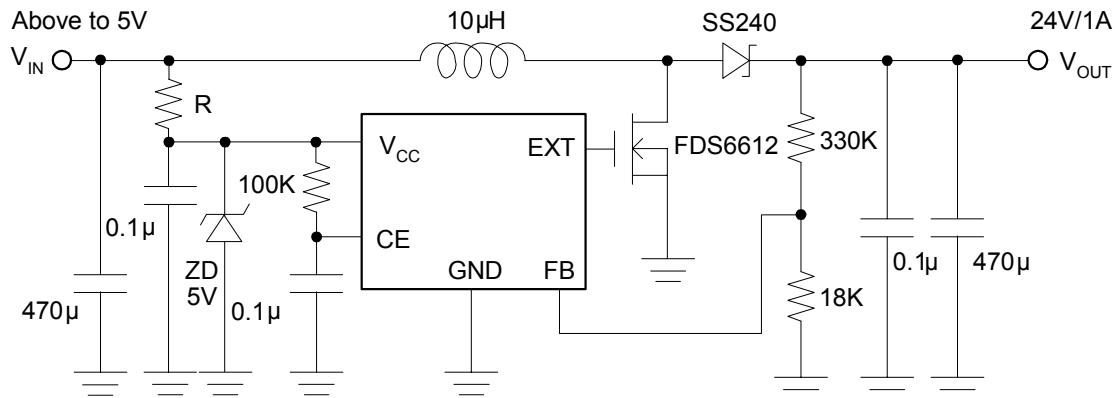
$$V_{OUT} = 1.23 \times \left(1 + \frac{R1}{R2}\right), R2 = 10K \sim 20K$$

(2) LV Circuit



$R_B = \text{Adjust according to load and } Tr. hFE \text{ levels}$
 $C_B \leq 1 / (2\pi \times R_B \times F_{osc} \times 0.7)$

(3) HV Circuit

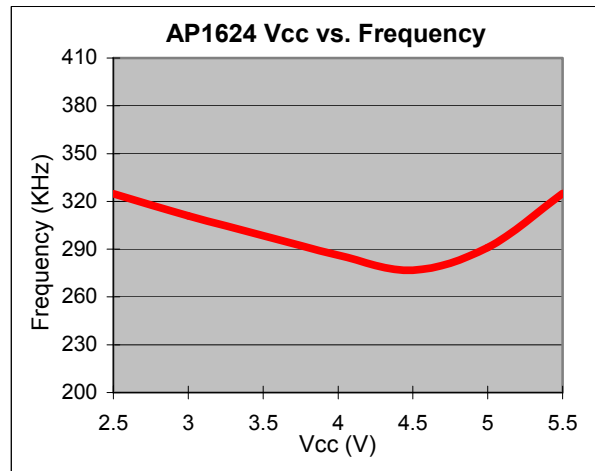
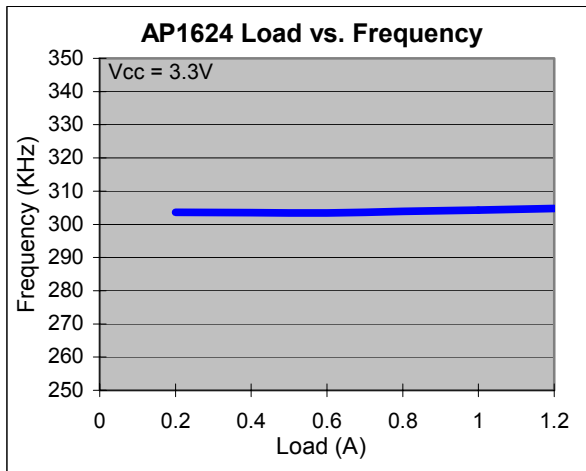
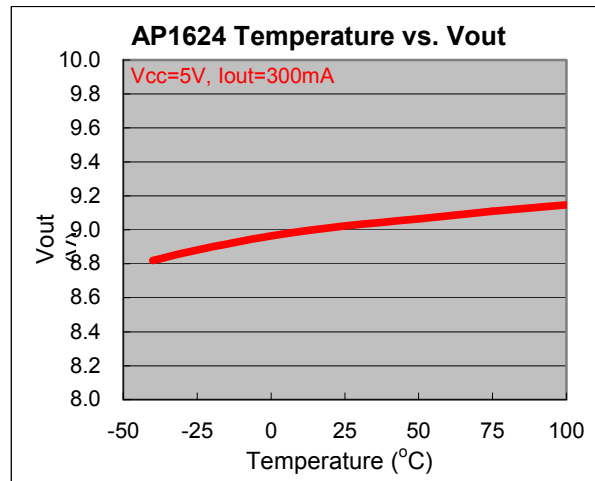
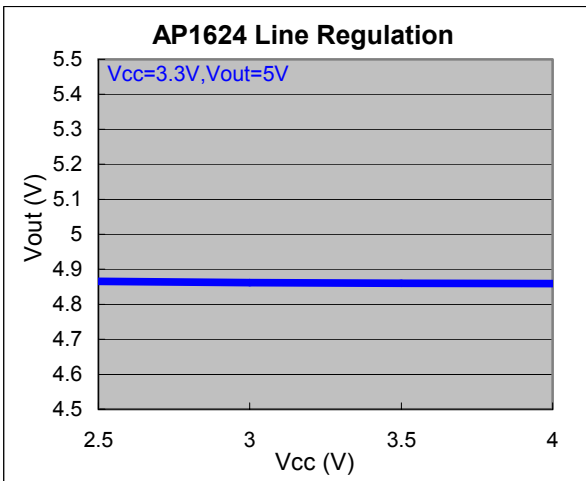
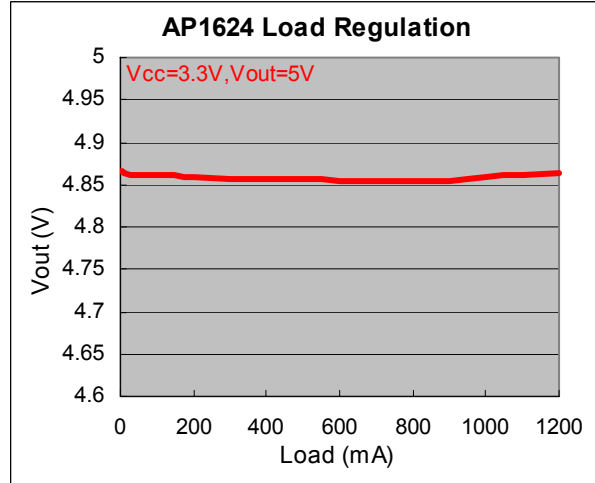
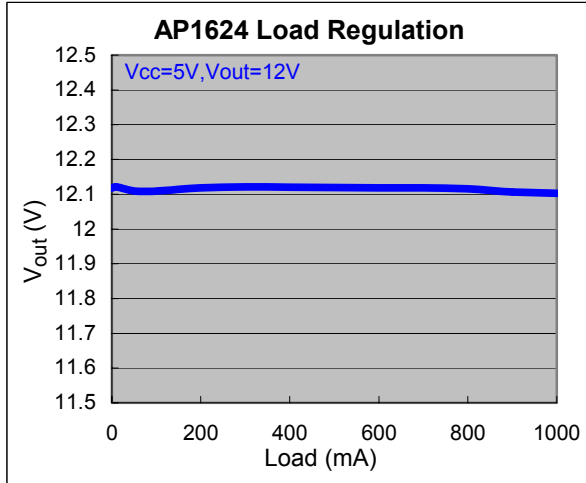


Not Recommended for New Designs



AP1624 PWM/PFM DUAL MODE STEP-UP DC/DC CONTROLLER

Typical Performance Characteristics

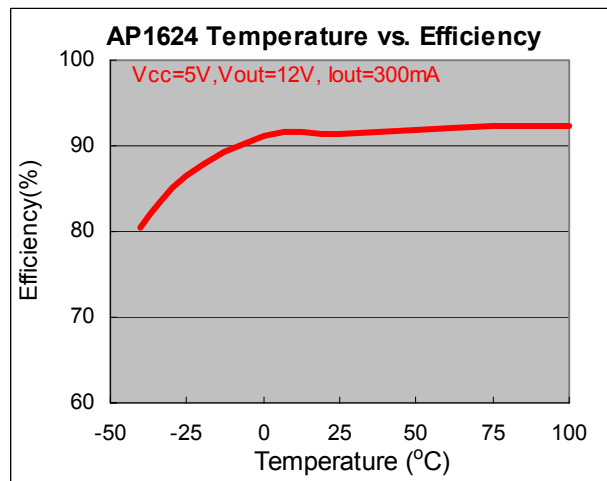
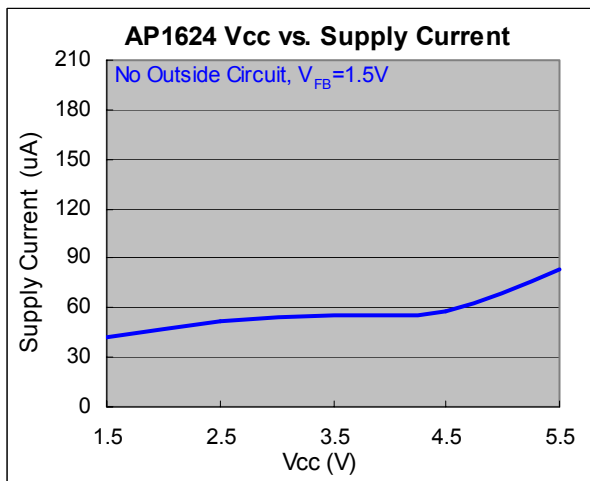
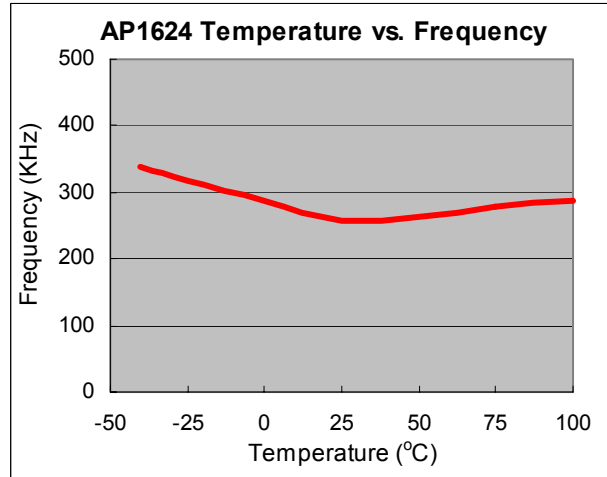
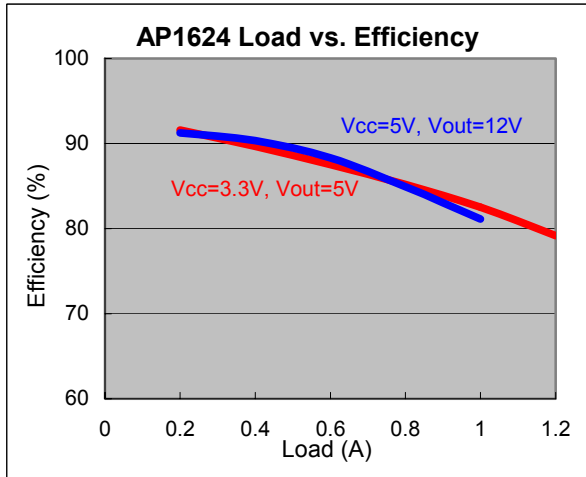


Not Recommended for New Designs

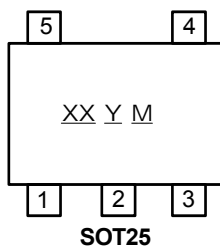


AP1624 PWM/PFM DUAL MODE STEP-UP DC/DC CONTROLLER

Typical Performance Characteristics (Continued)



Marking Information



XX : Identification code
Y : Year: 0-9
M : Month: A~L

Part Number	Package	Identification Code
AP1624	SOT25	EQ

Not Recommended for New Designs

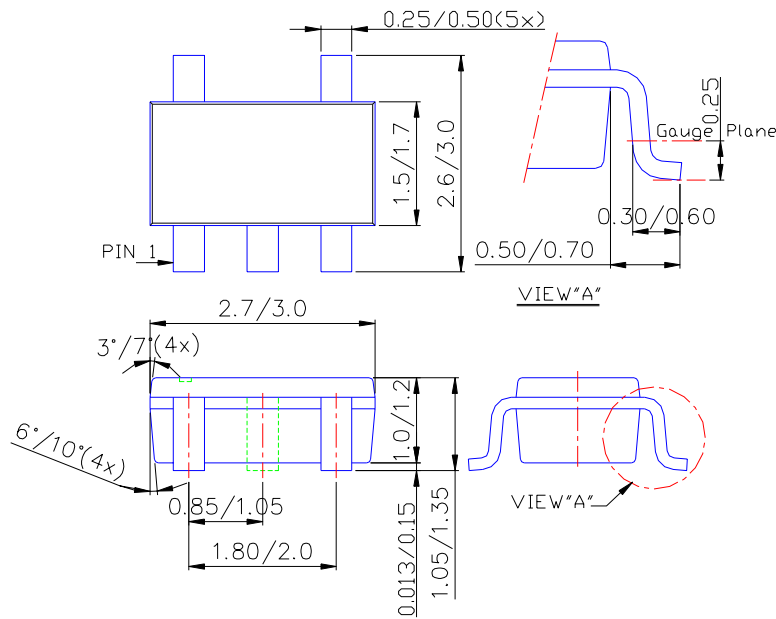
AP1624



PWM/PFM DUAL MODE STEP-UP DC/DC CONTROLLER

Package Information (unit: mm)

Package Type: SOT25



IMPORTANT NOTICE

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to any product herein. Diodes Incorporated does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

Diodes Incorporated products are not authorized for use as critical components in life support devices or systems without the expressed written approval of the President of Diodes Incorporated.