

## 2A, 150kHz, 40V BUCK DC/DC CONVERTER WITH LED DRIVER AND BATTERY CHARGE

### Descriptions

The FDK1596 is a 150KHz fixed frequency PWM buck (step-down) DC/DC converter, capable of driving a 2A load with high efficiency.

The PWM control circuit is able to adjust the duty ratio linearly from 0~100%. An enable function, an over current protection function is built inside. An internal compensation block is built in to minimize external component count.

### Features

- Wide 4.5V~40V Input Voltage Range
- Output Adjustable from 1.235V~37V
- Minimum Drop Out 1.5V
- Fixed 150kHz Switching Frequency
- 2A Constant Output Current Capability
- Internal Optimize Power Transistor
- TTL shutdown capability
- Excellent line and load regulation
- ON/OFF pin with hysteresis function

### Typical application

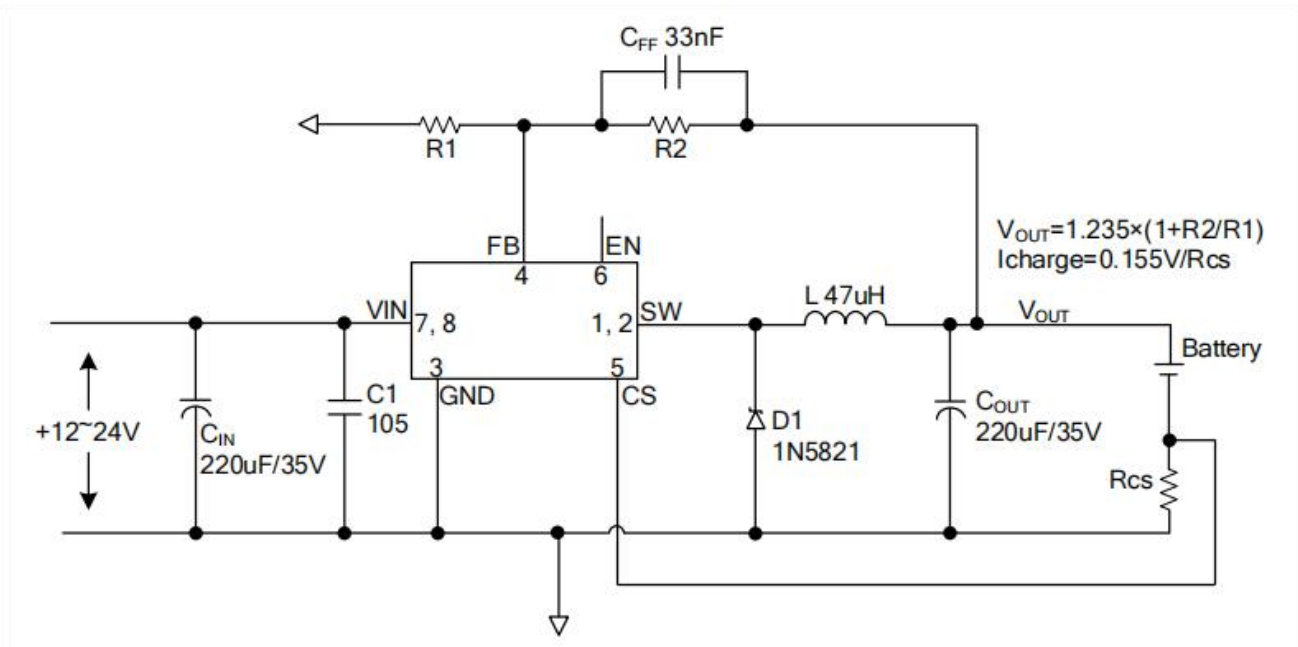


Figure 1. Typical Application Circuit (Li Battery Charger)

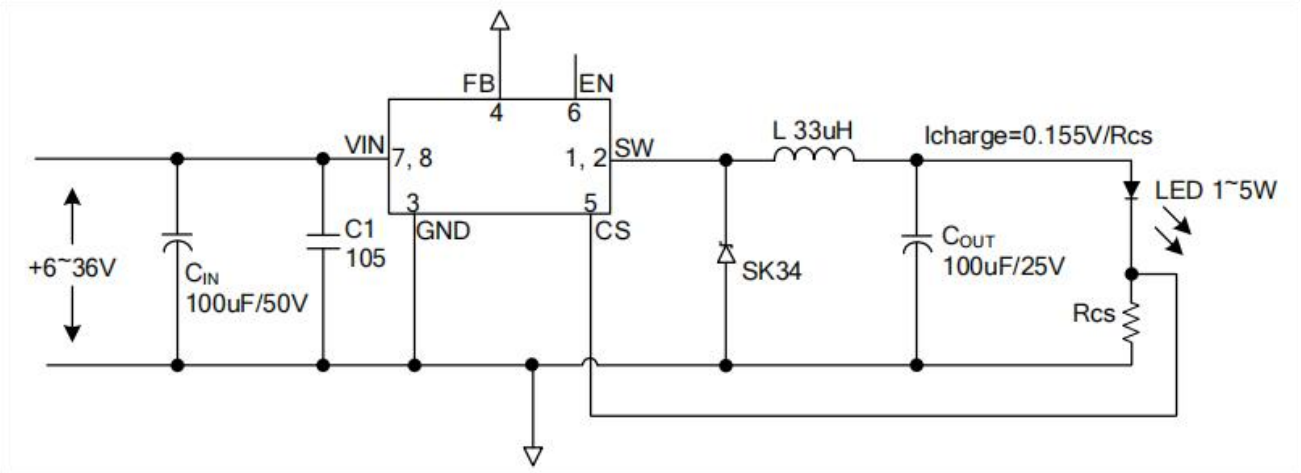
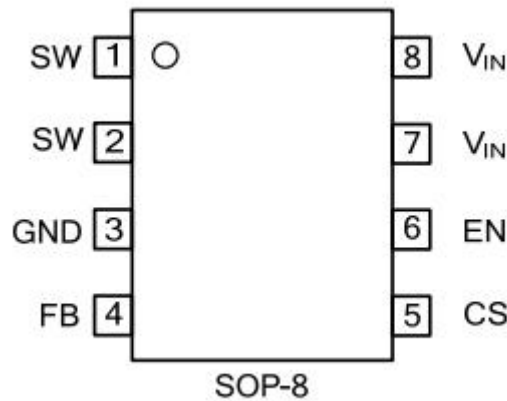


Figure 2. Typical Application Circuit (LED Constant Current Driver)

### Order Information

Mode	Package	Ordering Number	Packing Option
FDK1596	SOP8	FDK1596YSOP8G/TR	Tape and Reel,3000/4000

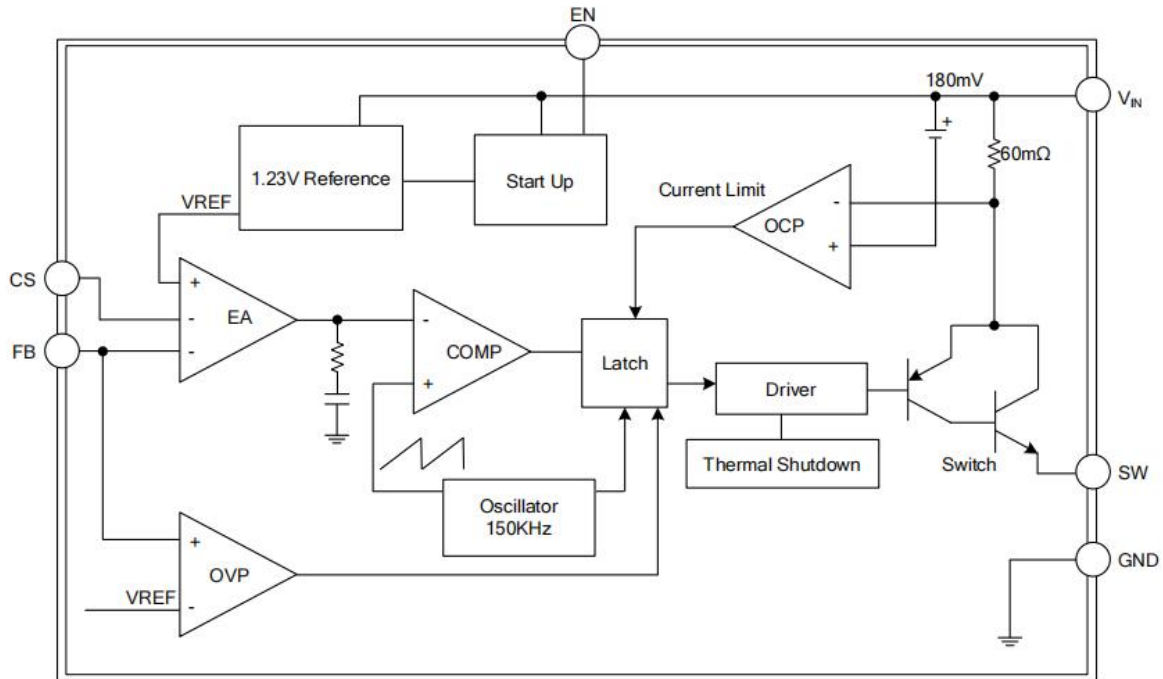
### Pin Configuration



### Pin Description

Pin No.	Pin Name	Description
1, 2	SW	Power Switch Pin (SW).
3	GND	Ground Pin.
4	FB	Output control Pin
5	CS	Output Current Sense Pin
6	EN	Enable Pin.
7, 8	VIN	Supply Voltage Input Pin.

## Block Diagram



## Absolute Maximum Rating

Parameter	Symbol	Ratings	Unit
Input Voltage	$V_{IN}$	-0.3 ~ 45	V
FB Pin Voltage	$V_{FB}$	-0.3 ~ $V_{IN}$	V
EN Pin Voltage	$V_{EN}$	-0.3 ~ $V_{IN}$	V
SW Pin Voltage	$V_{SW}$	-0.3 ~ $V_{IN}$	V
Power Dissipation	$P_D$	Internally limited	mW
Operating Junction Temperature	$T_J$	-40 ~ 125	°C
Storage Temperature	$T_{STG}$	-65 ~ 150	°C

## Thermal Data

Parameter	Symbol	Ratings	Unit
Junction to Ambient (No Heatsink, Free Air)	$\theta_{JA}$	150	°C/W
Junction to Case	SOP-8 $\theta_{JC}$	50	°C/W

## Electrical Characteristics

( $T_A=25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>System Parameters Test Circuit Figure 1</b>						
Feedback Voltage	$V_{FB}$	$V_{IN}=8\text{V}\sim 32\text{V}$ , $V_{OUT}=5\text{V}$ , $I_{LOAD}=0.2\text{A}\sim 2\text{A}$	1.21	1.235	1.26	V
Efficiency	$\eta$	$V_{IN}=12\text{V}$ , $V_{OUT}=5\text{V}$ , $I_{OUT}=2\text{A}$		81		%

## Electrical Characteristics (DC Parameters)

$V_{IN}=12V$ ,  $GND=0V$ ,  $V_{IN}$ & $GND$  parallel connect a 220uf/50V capacitor;  $I_{OUT}=500mA$ ,  $T_A=25^{\circ}C$ , the others floating unless otherwise specified

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Operation Voltage	$V_{IN}$		4.5		40	V
Shutdown Supply Current	$I_{STBY}$	$V_{EN}=5V$		80	200	$\mu A$
Quiescent Supply Current	$I_Q$	$V_{EN}=0V$ , $V_{FB}=V_{IN}$		2	5	mA
Oscillator Frequency	$F_{osc}$		127	150	172	Khz
Switch current Limit	$I_L$	$V_{FB}=0$		3		A
EN Pin Threshold	$V_{EN}$	High (Regulator OFF)		1.4		V
		Low (Regulator ON)		0.8		V
Output Saturation Voltage	$V_{CE}$	$V_{FB}=0V$ , $I_{SW}=2A$		1.1	1.4	V
Constant Current Sense Voltage	$V_{CS}$		0.132	0.155	0.178	V

## Package Outline Dimensions(All dimensions in mm.)

(1) Package Type: SOP8

