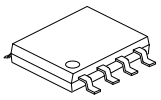
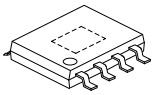
2A, 150kHz, 40V BUCK DC/DC CONVERTER WITH LED DRIVER AND BATTERY CHARGE



SOP-8



HSOP-8

■ DESCRIPTION

The UTC **LD1596** 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

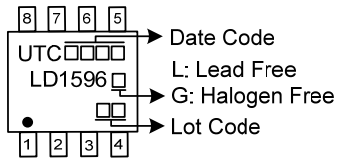
* Wide 4.5V~40V Input Voltage Range
* Output Adjustable from 1.235V~37V
* Minimum Drop Out 1.5V
* Fixed 150kHz Switching Frequency
* 2A Constant Output Current Capability
* Internal Optimize Power Transistor
* Excellent line and load regulation
* TTL shutdown capability
* ON/OFF pin with hysteresis function

■ ORDERING INFORMATION

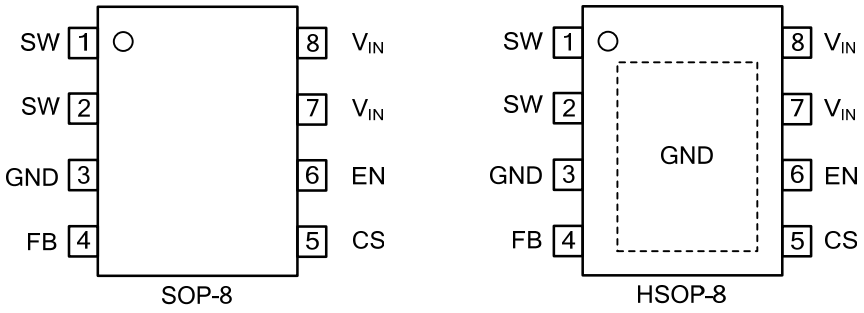
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LD1596L-S08-R	LD1596G-S08-R	SOP-8	Tape Reel
LD1596L-SH2-R	LD1596G-SH2-R	HSOP-8	Tape Reel

LD1596G-S08-R (1)Packing Type (2)Package Type (3)Green Package	(1) R: Tape Reel (2) S08: SOP-8, SH2: HSOP-8 (3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



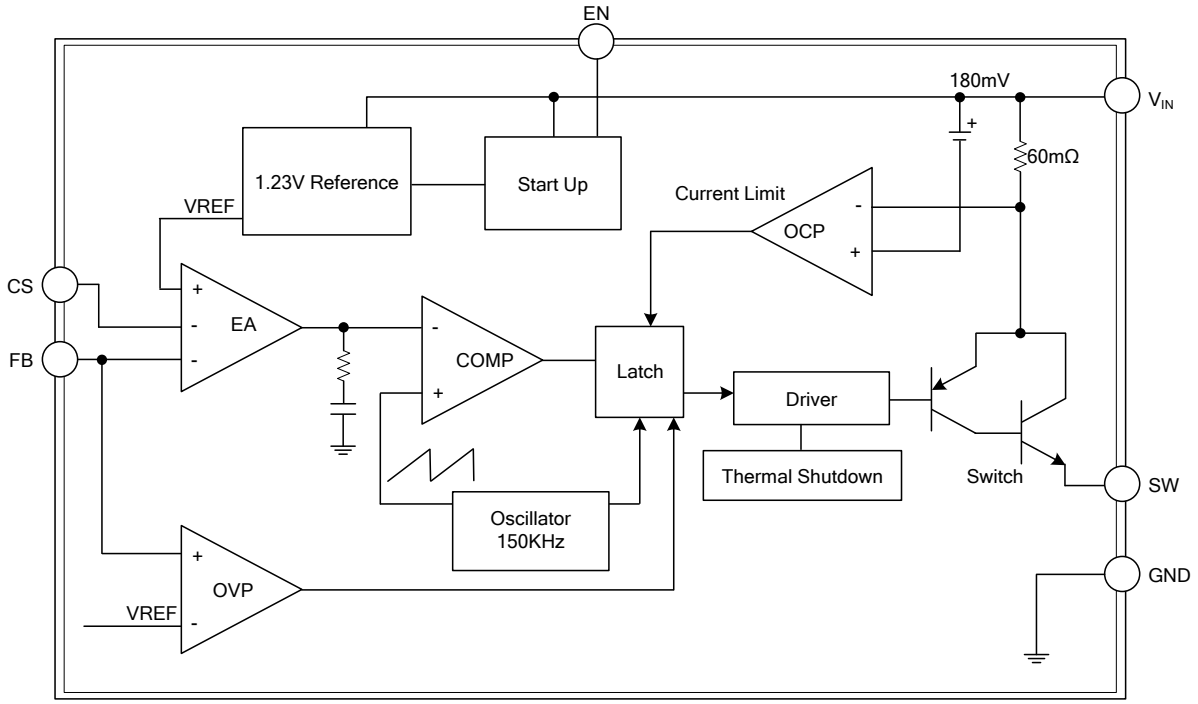
■ PIN CONFIGURATION



■ 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	V_{IN}	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

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient (No Heatsink, Free Air)		θ_{JA}	150	°C/W
Junction to Case	SOP-8	θ_{JC}	50	°C/W
	HSOP-8		45	°C/W

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
System Parameters Test Circuit Figure 1						
Feedback Voltage	V_{FB}	V_{IN}=8V~32V, V_{OUT}=5V, I_{LOAD}=0.2A~2A	1.21	1.235	1.26	V
Efficiency	η	V_{IN}=12V, V_{OUT}=5V, I_{OUT}=2A		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°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	uA
Quiescent Supply Current	I_Q	V_{EN}=0V, V_{FB}=V_{IN}		2	5	mA
Oscillator Frequency	Fosc		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

■ TYPICAL APPLICATION CIRCUIT

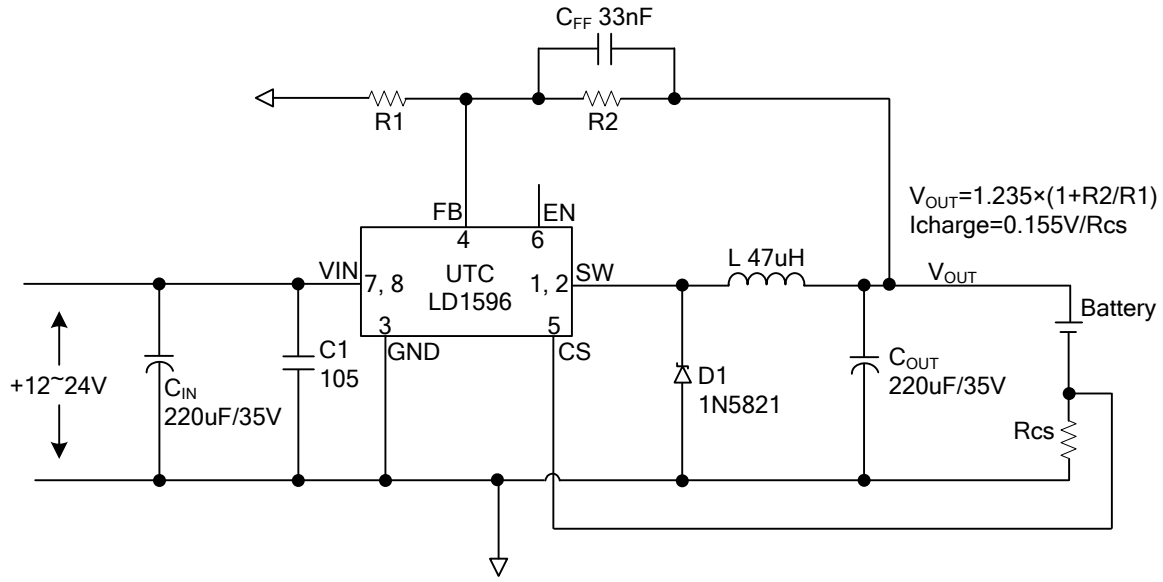


Figure 1. UTC **LD1596** Typical Application Circuit (Li Battery Charger)

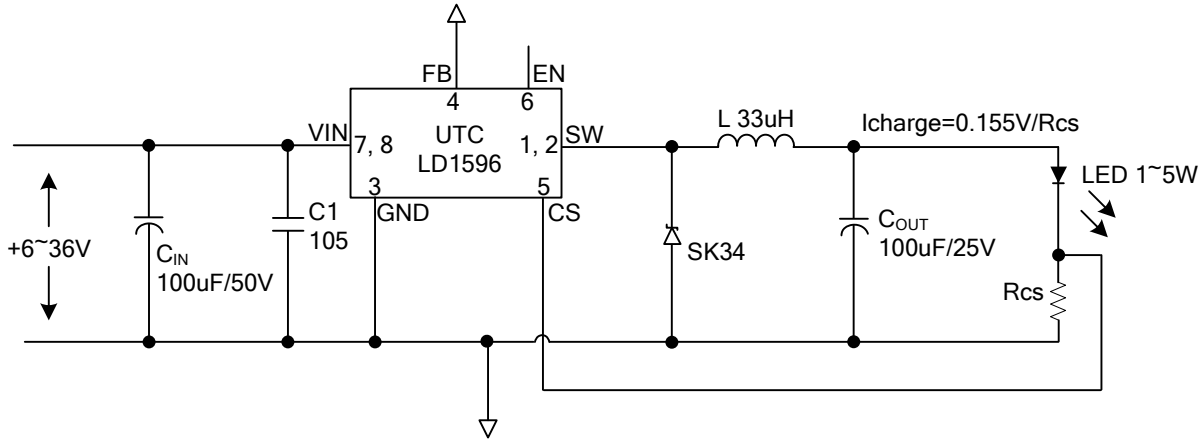


Figure 2. UTC **LD1596** Typical Application Circuit (LED Constant Current Driver)