

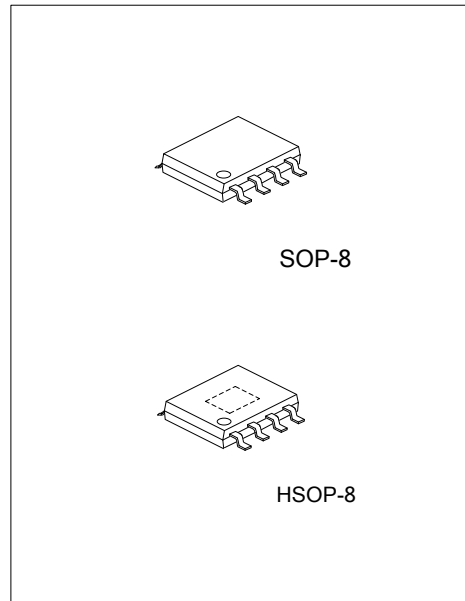


## LD1596

Preliminary

CMOS IC

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



#### 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

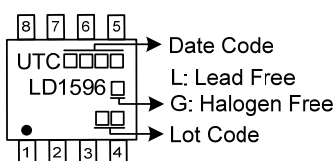
- \* Wide 4.5V~40V Input Voltage Range
- \* Output Adjustable from 1.235V~37V
- \* Minimum Drop Out 1.5V
- \* Fixed 150kHz Switching Frequency
- \* 2A Constant Output Current Capability
- \* Internal Optimize Power Transistor
- \* Excellent line and load regulation
- \* TTL shutdown capability
- \* ON/OFF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

#### ORDERING INFORMATION

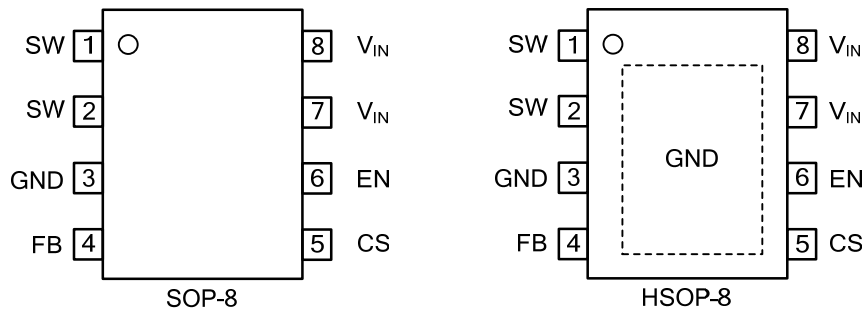
Ordering Number		Package	Packing
Lead Free	Halogen Free		
LD1596L-S08-R	LD1596G-S08-R	SOP-8	Tape Reel
LD1596L-SH2-R	LD1596G-SH2-R	HSOP-8	Tape Reel

<p>LD1596G-S08-R</p> <ul style="list-style-type: none"> <li>(1) Packing Type</li> <li>(2) Package Type</li> <li>(3) Green Package</li> </ul>	<ul style="list-style-type: none"> <li>(1) R: Tape Reel</li> <li>(2) S08: SOP-8, SH2: HSOP-8</li> <li>(3) G: Halogen Free and Lead Free, L: Lead Free</li> </ul>
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#### MARKING



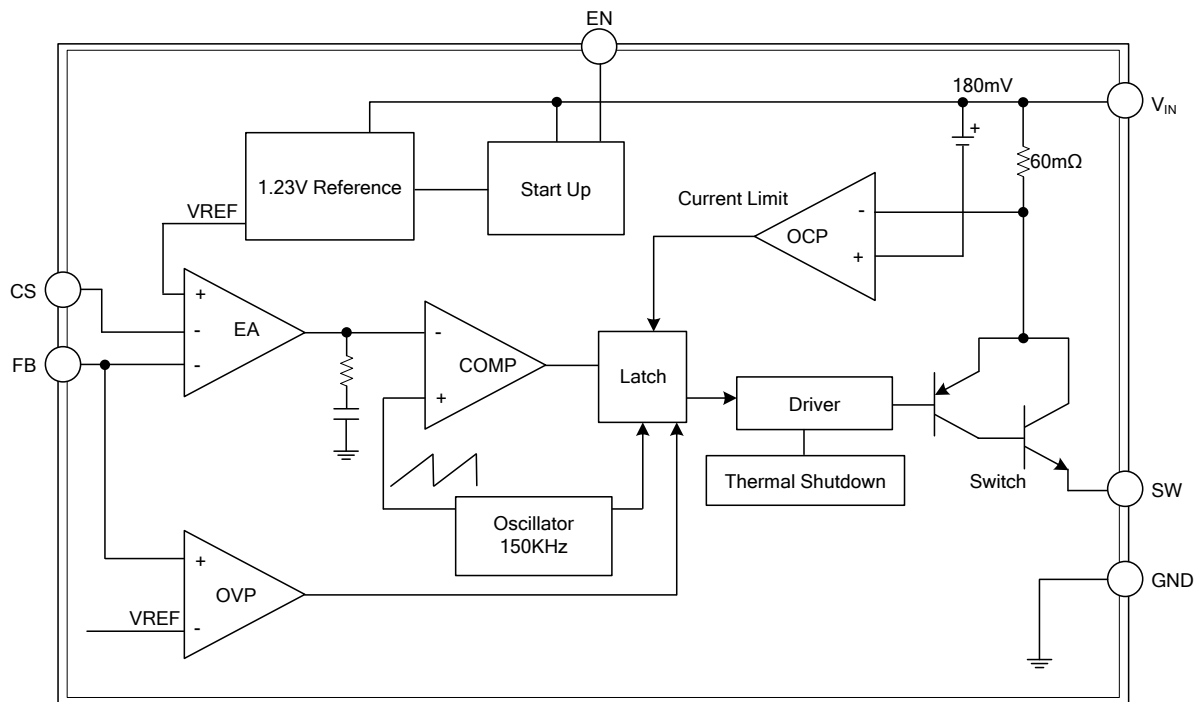
■ PIN CONFIGURATION



■ 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 <sub>IN</sub>	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)	$\theta_{JA}$	150	°C/W
Junction to Case	SOP-8	50	°C/W
	HSOP-8	45	°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	$V_{FB}$	$V_{IN}=8V\sim 32V$ , $V_{OUT}=5V$ , $I_{LOAD}=0.2A\sim 2A$	1.21	1.235	1.26	V
Efficiency	$\eta$	$V_{IN}=12V$ , $V_{OUT}=5V$ , $I_{OUT}=2A$		81		%

### ■ ELECTRICAL CHARACTERISTICS (DC PARAMETERS)

$V_{IN}=12V$ ,  $GND=0V$ ,  $V_{IN}$  &  $GND$  parallel connect a 220uf/50V capacitor;  $I_{OUT}=500mA$ ,  $T_A=25^\circ\text{C}$ , 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	$F_{osc}$		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

■ TYPICAL APPLICATION CIRCUIT

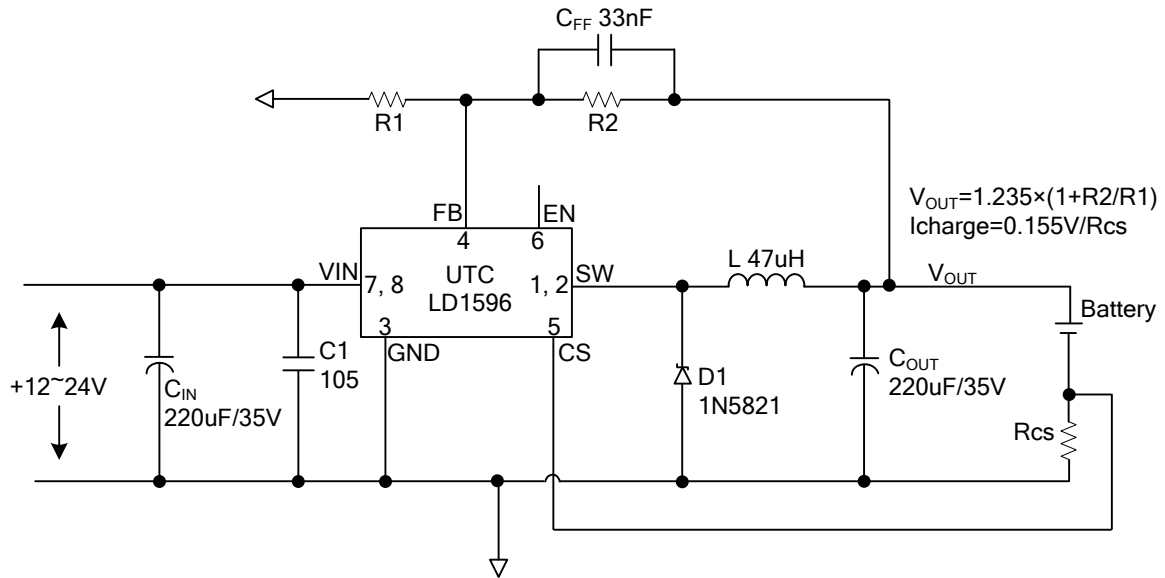


Figure 1. UTC LD1596 Typical Application Circuit (Li Battery Charger)

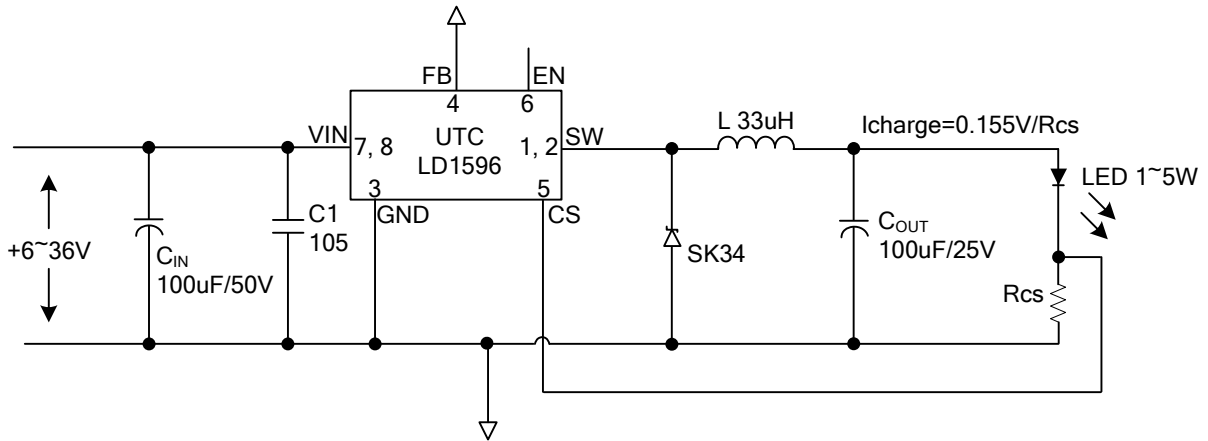


Figure 2. UTC LD1596 Typical Application Circuit (LED Constant Current Driver)

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