



LD1596

Preliminary

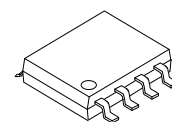
CMOS IC

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.



SOP-8

■ FEATURES

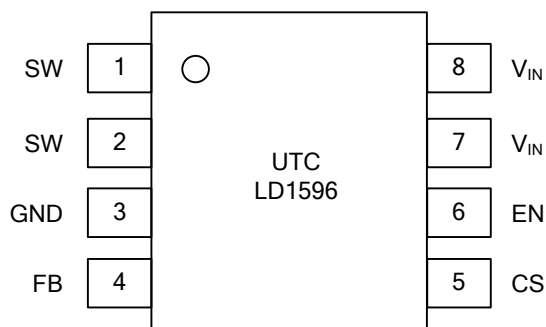
- * Wide 4.5V~40V Input Voltage Range
- * Output Adjustable from 1.235V~37V
- * Minimum Drop Out 1.5V
- * Fixed 150kHz Switching Frequency
- * 2A Constant Output Current Capability
- * Internal Optimize Power Transistor
- * Excellent line and load regulation
- * TTL shutdown capability
- * ON/OFF pin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

■ ORDERING INFORMATION

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

<p>LD1596L-S08-T</p> <p>(1)Packing Type</p> <p>(2)Package Type</p> <p>(3)Lead Free</p>	<p>(1) T: Tube, R: Tape Reel</p> <p>(2) S08: SOP-8</p> <p>(3) L: Lead Free, G: Halogen Free</p>
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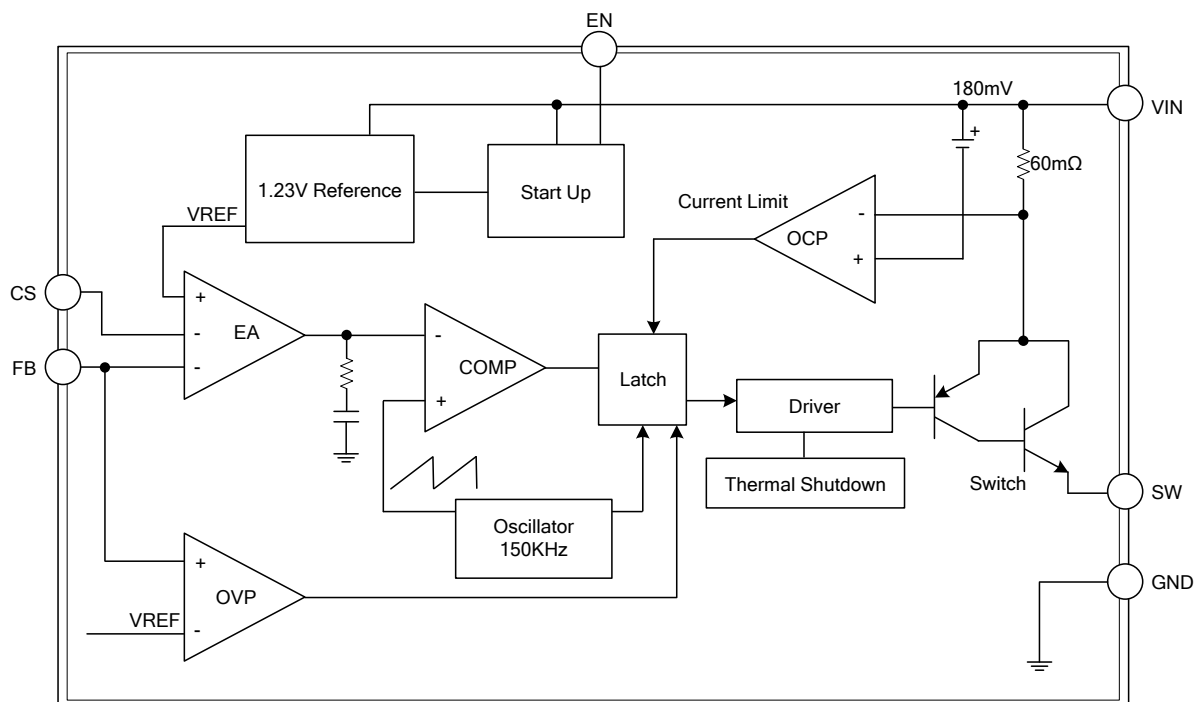
PIN CONFIGURATION



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
Thermal Resistance (Junction to Ambient, No Heatsink, Free Air)	R_{JA}	50	°C/W
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	θ_{JA}	150	°C/W

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
System Parameters Test Circuit Figure 1						
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	η	$V_{IN}=12\text{V}$, $V_{OUT}=5\text{V}$, $I_{OUT}=2\text{A}$		81		%

■ ELECTRICAL CHARACTERISTICS (DC PARAMETERS)

$V_{IN}=12\text{V}$, $GND=0\text{V}$, V_{IN} & GND parallel connect a 220uf/50V capacitor; $I_{OUT}=500\text{mA}$, $T_A=25^\circ\text{C}$, 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}	$V_{EN}=5\text{V}$		80	200	uA
Quiescent Supply Current	I_Q	$V_{EN}=0\text{V}$, $V_{FB}=V_{IN}$		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}	$V_{FB}=0\text{V}$, $I_{SW}=2\text{A}$		1.1	1.4	V
Constant Current Sense Voltage	V_{CS}		0.132	0.155	0.178	V

■ TYPICAL APPLICATION CIRCUIT

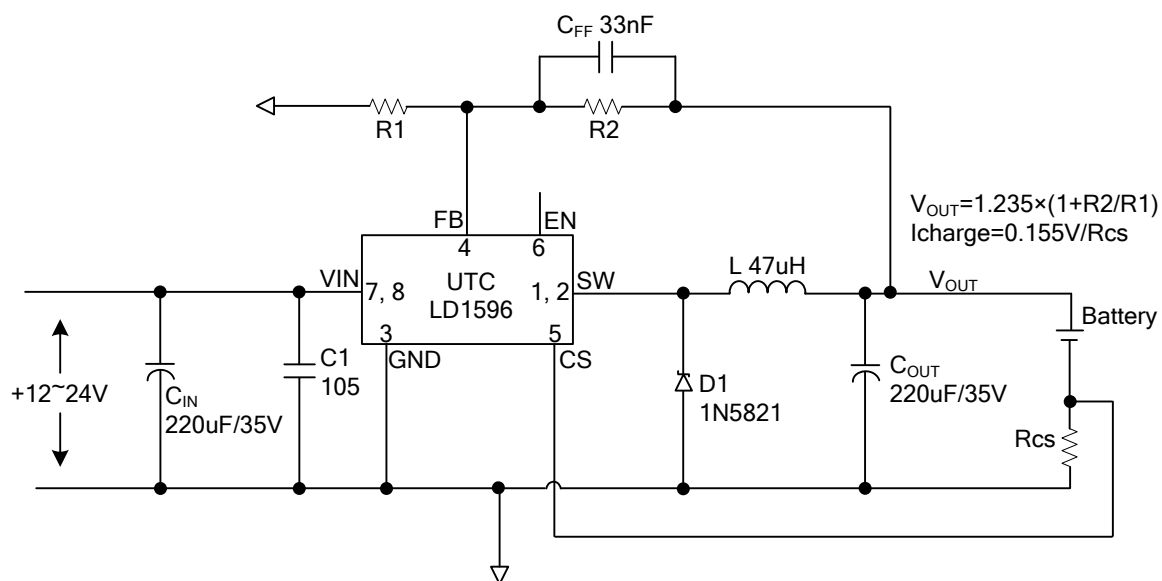


Figure 1. UTC LD1596 Typical Application Circuit (Li Battery Charger)

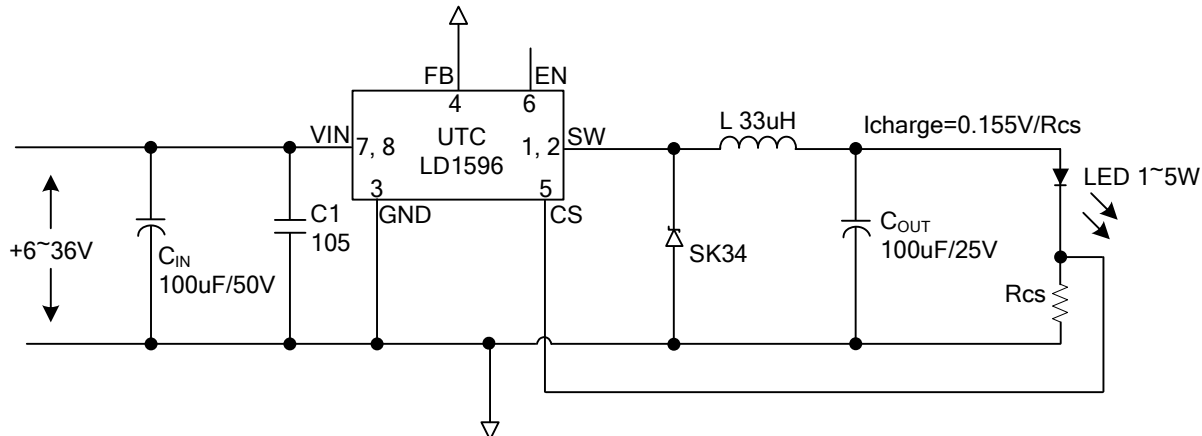


Figure 2. UTC LD1596 Typical Application Circuit (LED Constant Current Driver)

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