

泰德半导体-提供样品, 技术支持 13418601901 QQ409545144

General Description

TD1741 is a Synchronous Buck Controller with two current sense pins suitable for many multi-output applications. It is designed to allow for operating a wide supply voltage range from 6V to 40V. It has both high-side and low-side drivers allowing synchronous configuration using two external power-NMOS. This IC can operate in both Constant Current (CC) and Constant Voltage (CV) modes.

TD1741 operates as a Buck Controller providing a wide range of outputs at Constant Voltage (CV) from 6V to 40V and the output current as high as 10A or above. It has a Constant Current (CC) mode so that output current can be set externally and at an accuracy of $\pm 4\%$.

The current mode control and external compensation makes feedback control have good line and load regulation with flexible external design.

Features

- Vin: 6V to 40V, UVLO=5.5V \pm 0.5V
- Vout: 3V to 28V; typical at 5V
- Precision CC/CV Mode Control
- Burst/PFM Mode for Increased Light Load Efficiency
- 2 outputs independent Constant Current setting
- Hiccup mode when output voltage below 50% normal output voltage
- Protection:
 - NMOS peak current limit: accuracy: $\sim 20\%$
 - Output short protection: reduce input current to less than 20mA (RMS)
 - Output FB OVP (125% VFB), only turn off High side MOS.
 - Temperature shutdown (OTP)
- Adjustable Output Cable Resistance Compensation
- Duty: 0~98% ($T_{off_min}=100ns$, Dead-time=25~35ns)
- Switching Frequency: 125k \pm 25k
- Integrated MOSFET Drivers
- QFN12L Package

Pin Configurations

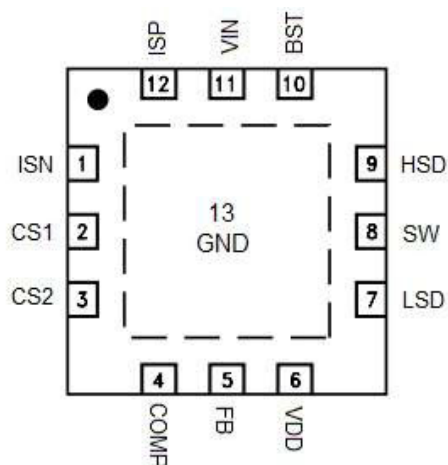


Figure1 Pin Configuration of TD1741(Top View)

Applications

- Car Charger
- High-Brightness Lighting
- General-Purpose DC/DC Controller

Pin Description

Pin Number	Pin Name	Description
1	ISN	Input Current Sense.
2	CS1	Current sense of the 1st output.
3	CS2	Current sense of the 2nd output.
4	COMP	Error Amplifier Output. The Converter stability compensation network is placed.
5	FB	Feedback input with reference to 1.20V. It can set output voltage.
6	VDD	Internal 5v power supply, a 1uF (or more) capacitor is connected between this pin and GND.
7	LSD	Low Side Driver
8	SW	Inductor terminal.
9	HSD	High Side Driver
10	BST	Internal High Side Driver Power Bias which is typically 5V above Vin. A typical 0.1uF capacitor is used connecting between BST and SW pins.
11	VIN	Supply input
12	ISP	Input Current Sense.
13	GND	Ground pin.

Function Block

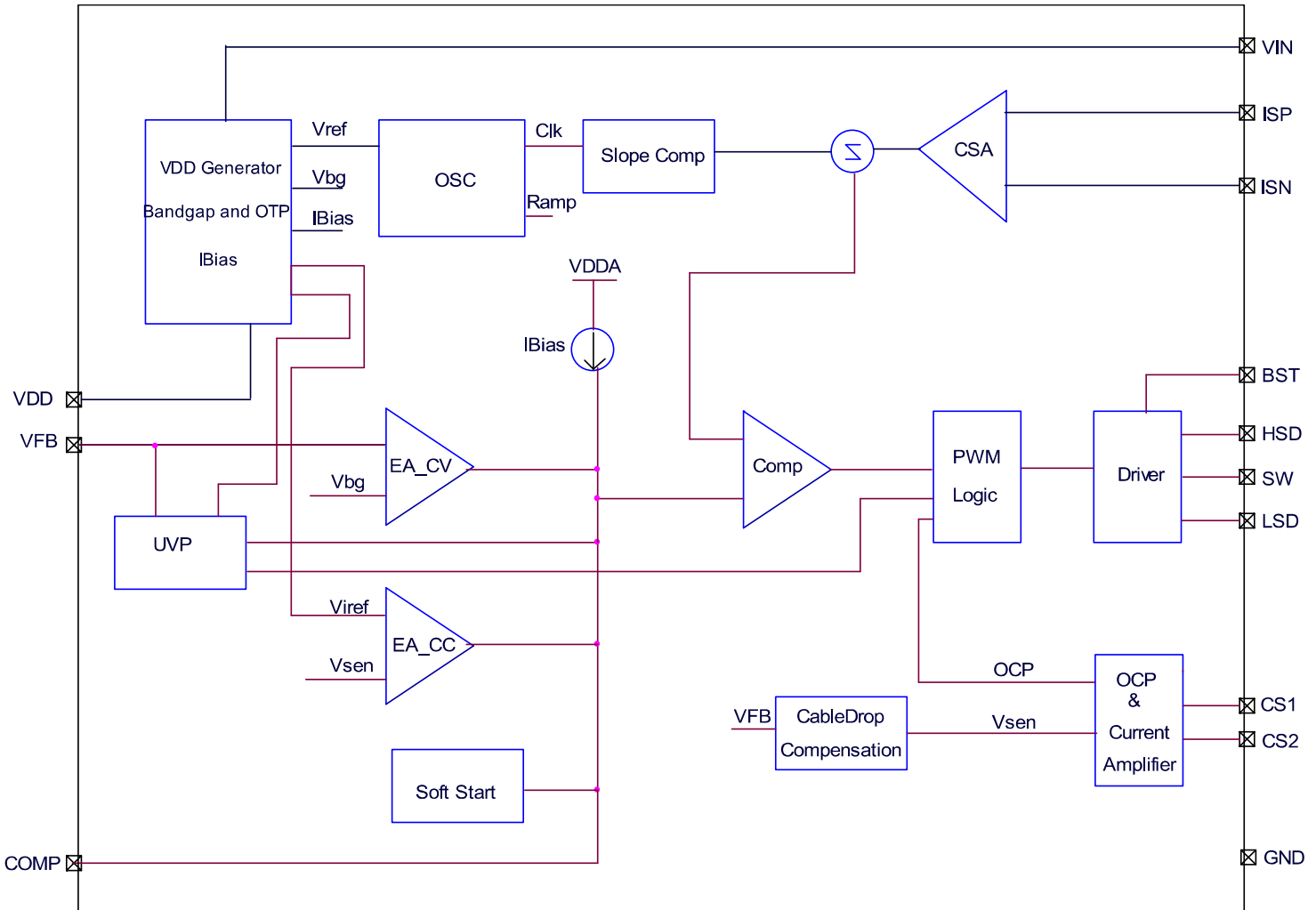


Figure 2 Function Block Diagram of TD1741

Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
VIN	Supply Input Voltage	-0.3 to +43	V
	ISP,ISN to VIN	-0.3 to +0.3	V
	BST to SW	-0.3 to +6	V
	SW to GND	-0.3 to VIN+0.6	V
	BST,HSD to GND	VSW-0.3 to VSW+6	V
	VDD,VFB,ISET,COMP,LSD,CS1-2 to GND	-0.3 to +6	V

40Vin 2 Outputs Buck Controller
TD1741

ESD	HBM (Human Body Mode)	2K	V
θ_{JA}	Thermal Resistance from Junction to ambient	40	$^{\circ}\text{C}/\text{W}$

Recommended Operating Conditions

Symbol	Parameter	Rating			Unit
		Min.	Typ.	Max.	
V _{IN}	Supply Voltage	6*	-	40	V
V _{OUT}	Output voltage range	3	-	28	V
I _{OUT}	Output current range	-	-	15	A
T _{OP}	Operating Temperature	-40	-	85	$^{\circ}\text{C}$
T _{STG}	Storage Temperature Range	-65	-	150	$^{\circ}\text{C}$
T _J	Junction Temperature	-40	-	150	$^{\circ}\text{C}$
T _{SDR}	Maximum Lead Soldering Temperature, 10 Seconds	260			$^{\circ}\text{C}$

Note: * when supply voltage is around 6V, output load current should be less than 5A.

Electrical Characteristics

(V_{IN}=12V, T_A=25 $^{\circ}\text{C}$ (unless otherwise specified). MOSFET use TDM3436)

Symbol	Characteristic	Test conditions	Min	Typ	Max	Unit
V _{IN}	Supply Voltage		6.0	-	40	V
I _{IN}	Supply Input Current	V _{out} =5V, No load	1	1.7	3.5	mA
VIN UVLO						
V _{UP}	V _{IN} UVLO Turn ON	V _{IN} Rising	5.7	6.0	7.1	V
V _{HYS}	V _{IN} UVLO Hysteresis	V _{IN} Falling	-	0.6	-	V
Feedback voltage						
V _{FB}	Feedback voltage		1.176	1.20	1.224	V
	Tolerance		-2	-	2	%
Soft Start						
	Soft Start time		-	6	-	ms
Oscillator						
F _{SW}	Switch frequency		100	125	150	KHz
T _{ON}	Minimum On-Time		-	100	-	ns
D	Duty cycle		-	-	98	%
Current sense						
V _{THCC}	CC threshold		65	68	71	mV
I _{FB}	Cable compensation Current	CS1-2=68mv	-	2	-	uA
HDR & LDR Drivers						

40Vin 2 Outputs Buck Controller **TD1741**

T _{RH}	HDR Rising Time		-	30	-	ns
T _{FH}	HDR Falling Time		-	20	-	ns
T _{RL}	LDR Rising Time		-	30	-	ns
T _{FL}	LDR Falling Time		-	20	-	ns
T _{LH}	Dead Time		-	30	-	ns
T _{HL}	Dead Time		-	30	-	ns
Thermal Shutdown(OTP)						
T _{SD}	Temperature Rising		-	150	-	°C
T _{HYS}	OTP Hysteresis		-	20	-	°C

Typical Application Circuit

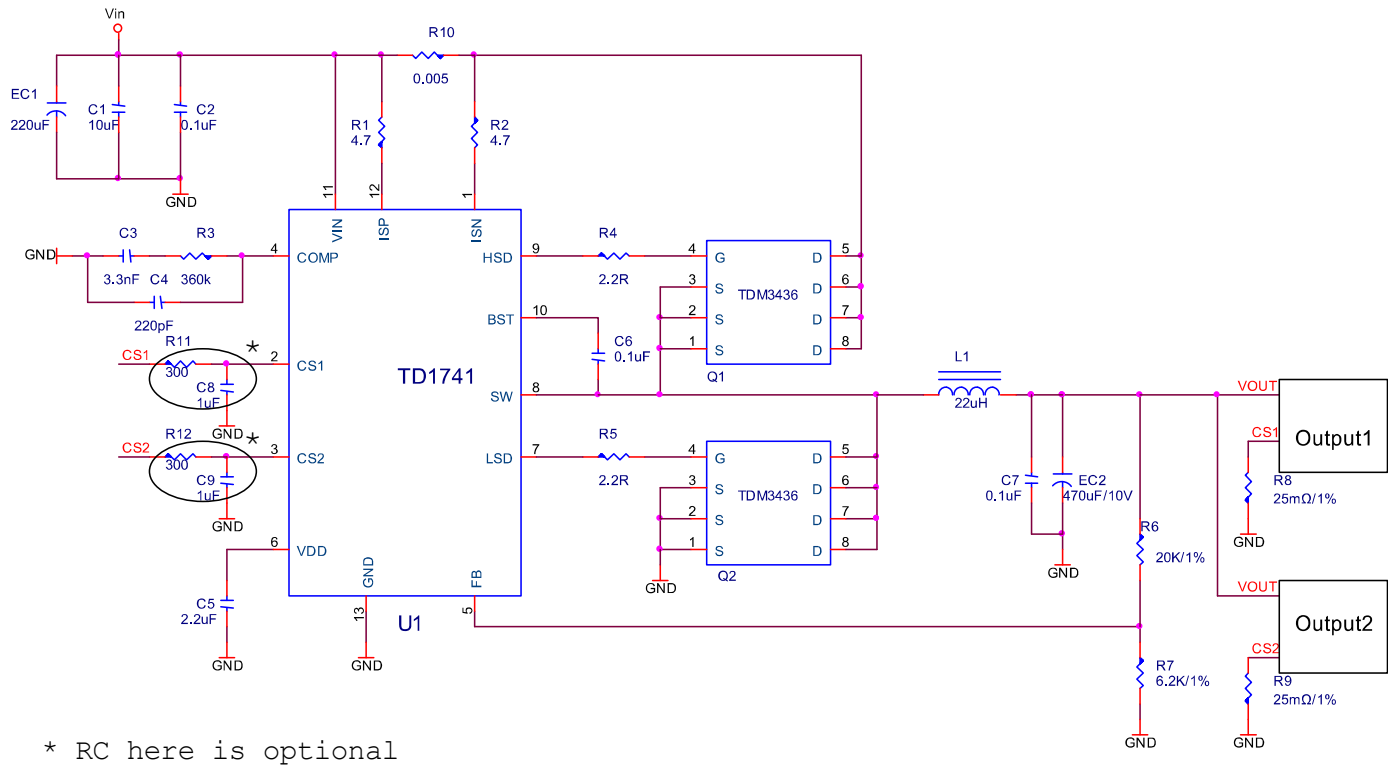


Figure 3 2-outputs with CC(CS1 and CS2)