SP6837

LOW-POWER OFF-LINE PRIMARY SIDE REGULATION CONTROLLER

DESCRIPTION

The SP6837 has the built-in programmable cable voltage drop compensation function, which make it flexible to accommodate various cables with different gauges and lengths.

The SP6837provides accurate constant voltage, constant current (CV/CC) regulation without requiring an opto-coupler and secondary control circuitry. It also eliminates the need of loop compensation circuitry while maintaining stability.

The SP6837 achieves excellent regulation and high average efficiency, yet meets the requirement for no-load consumption less than 30mW.

The SP6837is a high performance AC/DC power supply controller for battery charger and adapter applications. The device uses Pulse Frequency Modulation (PFM) method to build discontinuous conduction mode (DCM) flyback power supplies.

The SP6837is available in SOIC-8 package.

FEATURES

- Primary Side Control for Eliminating Opto-coupler and Secondary CV/CC Control Circuitry
- 30mW No-load Input Power
- Programmable Output Cable Voltage Drop Compensation
- Proprietary CC Tightening Technique to Achieve Vertical CC Profile
- Compensation for External Component Temperature Variations
- Flyback Topology in DCM Operation
- Random Frequency Adjustment to Reduce System EMI
- Built-in Soft Start
- Over Voltage Protection
- Short Circuit Protection
- SOIC-8 Package

APPLICATIONS

- Adapter/Chargers for Cell/Cordless Phones, PDAs, MP3 and Other Portable Apparatus
- LED Driver
- Standby and Auxiliary Power Supplies

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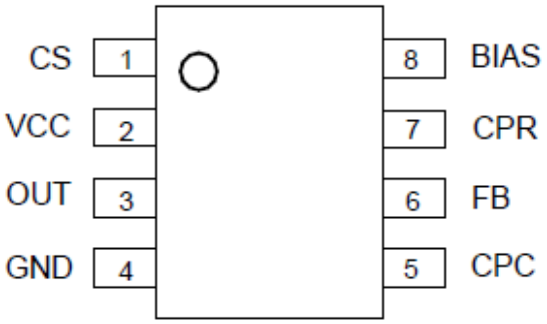
Pin Configuration

M Package

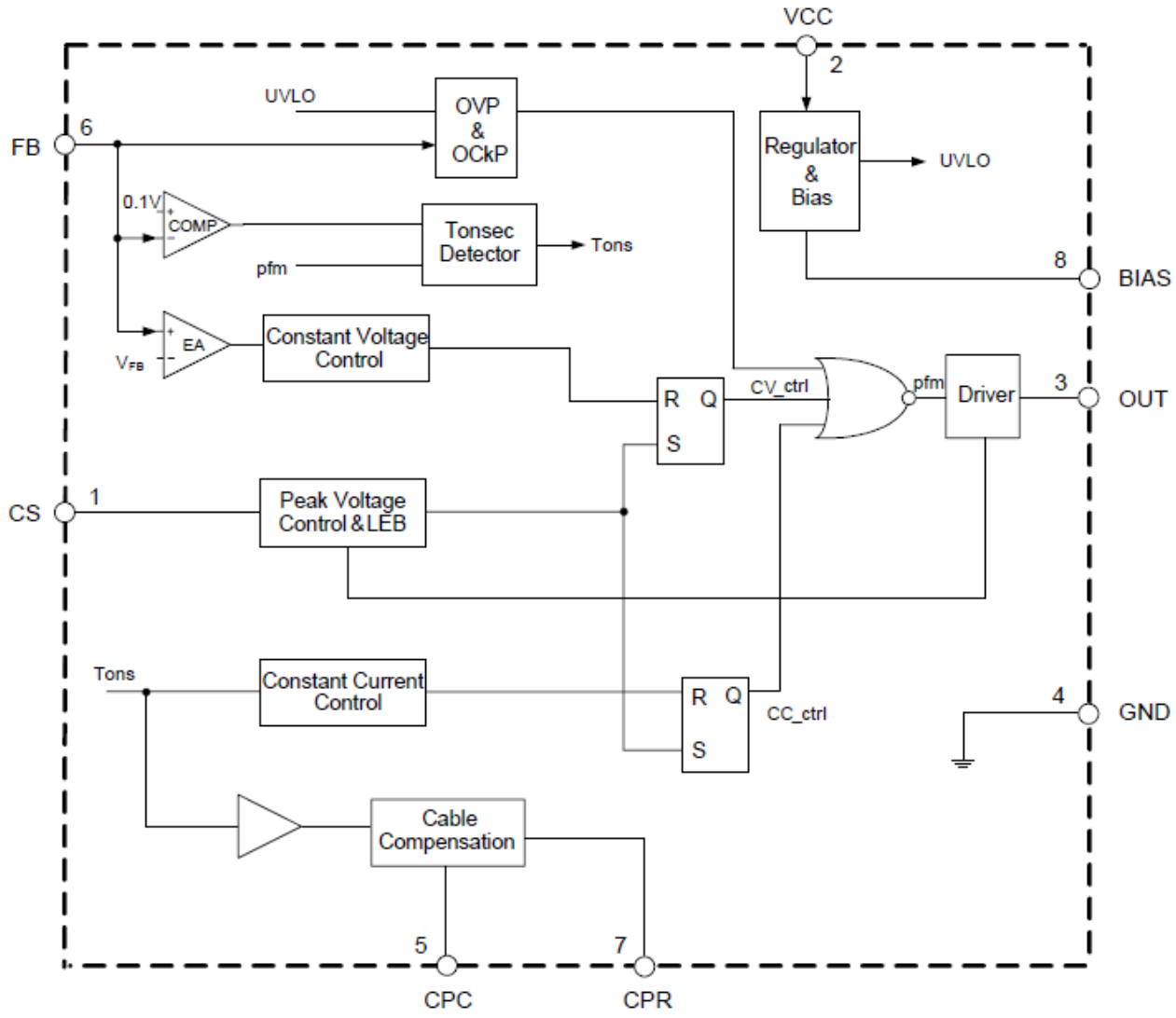
(SOIC-8)



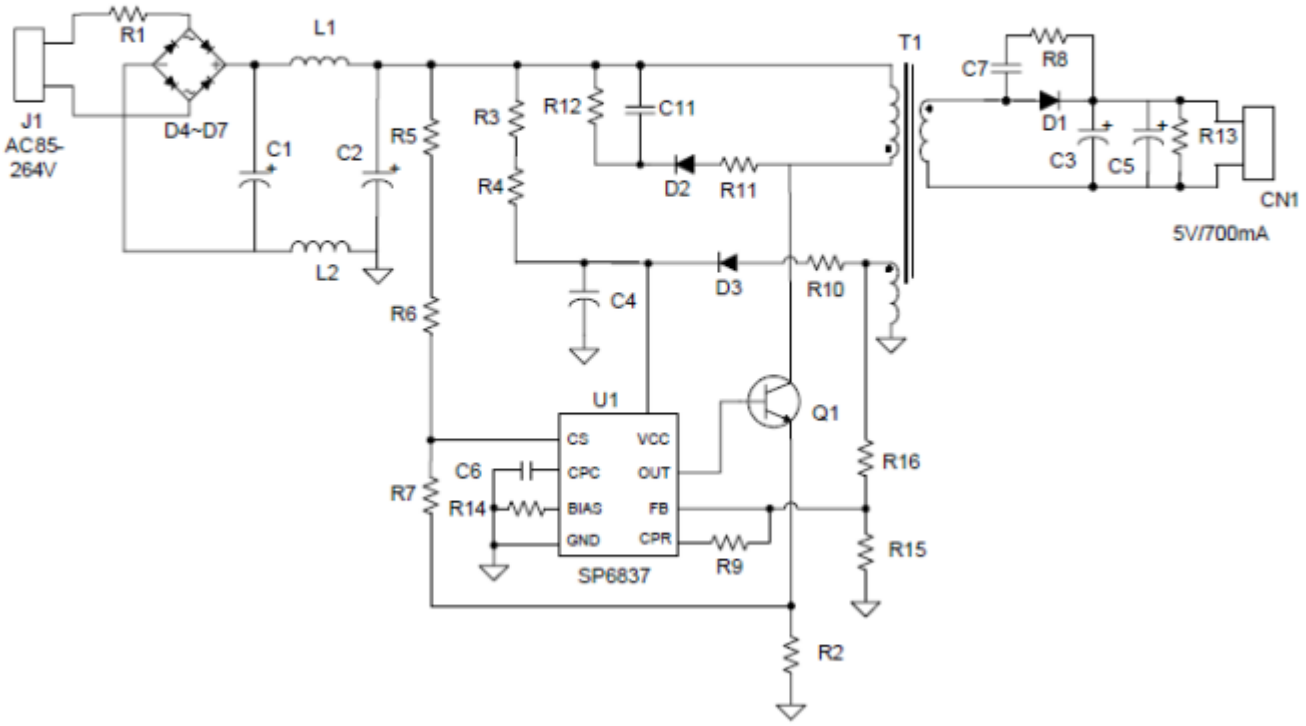
Pin Description

Pin Number	Pin Name	Function
1	CS	The primary current sense
2	VCC	Supply voltage
3	OUT	This pin drives the base of external power NPN switch
4	GND	Ground
5	CPC	This pin connects a capacitor for output cable compensation
6	FB	The voltage feedback from the auxiliary winding
7	CPR	Connects a resistor to FB pin for adjustable output cable compensation
8	BIAS	This pin sets the bias current inside SP6837 with an external resistor to GND

Functional Block Diagram



Typical Application



ORDERING INFORMATION

Part Number	Package	Part Marking
SP6837D8TGB	DIP-8P	SP6837
SP6837S8RGB	SOP-8P	SP6837

※ SP6837D8TGB : Tube ; Pb – Free ; Halogen-Free

※ SP6837S8RGB : Tape Reel ; Pb – Free ; Halogen-Free

PART MARKING

SOIC-8

A : Lot Code
B : Date Code

ABSOULTE MAXIMUM RATINGS (T_A=25℃, unless otherwise specified.)

The following ratings designate persistent limits beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	-0.3 ~ 36	V
$V_{COMP\,/\,RT\,/\,CS}$	COMP / RT / CS Voltage	-0.3 ~ 7.0	V
OUT	Output Current at OUT	Internally limiter	A
ESD	Human Body Model	2	KV
	Machine Model	200	V
FB	FB input	-40 ~ 10	V
T_J	Operating Junction Temperature Range	150	℃
T_{STG}	Storage Temperature Range	-65 ~ 150	℃
T_{LEAD}	Pb-Free Lead Soldering Temperature for 5 sec.	300	℃
$R_{\Theta JC}$	Thermal Resistance Junction – Case (*)	190	℃/W

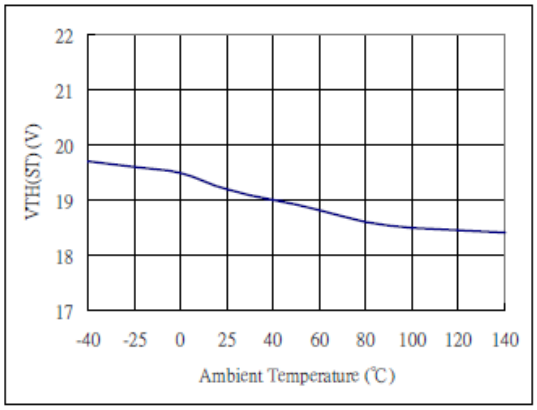
(*)Note 1: Stresses greater than those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "Recommended Operating Conditions" is not implied. Exposure to "Absolute Maximum Ratings" for extended periods may affect device reliability.

ELECTRICAL CHARACTERISTICS

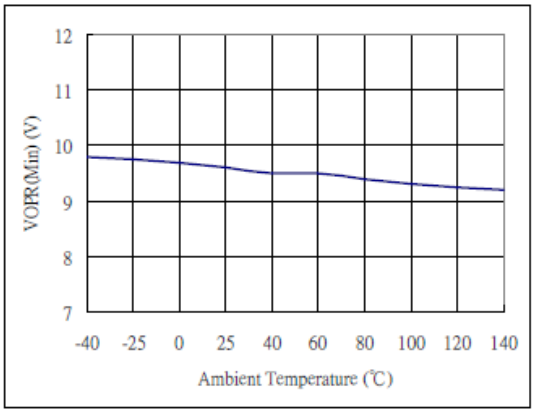
(T_A=25℃, V_{CC}=15V, unless otherwise specified.)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
UVLO SECTION						
$V_{TH(ST)}$	Start-up Threshold		17	18.5	21	V
$V_{OPR(min)}$	Minimal Operating Voltage		8.2	9.2	10.2	V
Reference Voltage						
V_{BIAS}	BIAS Pin Voltage	R_{BIAS}=200KΩ , After Turn On	1.0	1.1	1.2	V
STANDBY CURRENT SECTION)						
I_{ST}	Start-up Current	$V_{CC}=V_{TH(ST)}$-0.5V, R_{BIAS}=200KΩ Before start-up			1.5	uA
$I_{CC(OPR)}$	Operating Current	R_{BIAS}=200KΩ		390	480	uA
DRIVE OUTPUT SECTION						
I_{OUT}	OUT Maximum Current Source	R_{BIAS}=200KΩ	20	30	40	mA
CURRENT SENSE SECTION						
V_{CS}	Current Sense Threshold		490	513	535	mV
$V_{CS(PRE)}$	Pre-Current Sense		390	413	435	mV
	Leading Edge Blanking			500		ns
FEEDBACK INPUT SECTION						
I_{FB}	Feedback Pin Input Leakage Current	V_{FB}=4V	2.0	3.0	4.0	uA
V_{FB}	Feedback Threshold		3.97	4.03	4.09	V
$V_{FB(EN)}$	Enable Turn-on Voltage		-2.0	-1.7	-1.4	V
OUTPUT VOLTAGE COMPENSATION SECTION						
V_{CPR}	CPR Voltage	Dons (Tons/T): from 55% to 0.02%	1.5		3.5	V
I_{CPR}	CPR Sink Current				200	uA
PROTECTION SECTION						
$V_{FB(OVP)}$	Over Voltage Protection		7	8	9	V

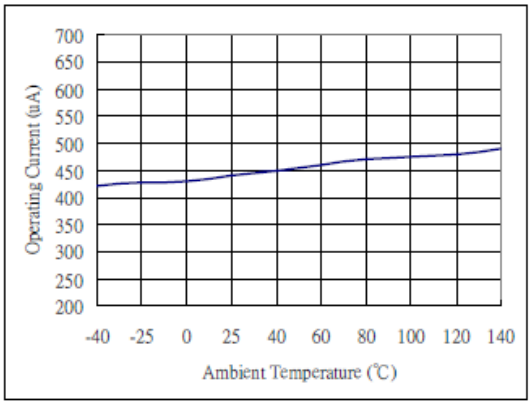
Typical Performance Characteristics



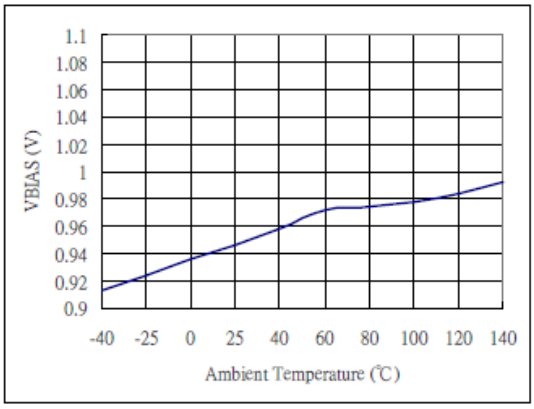
Start-up voltage vs. Ambient Temperature



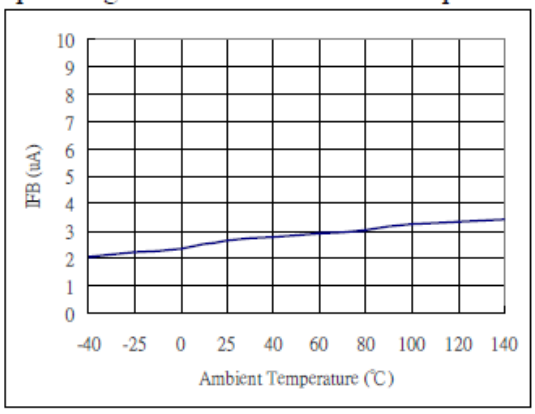
Minimal Operating Voltage vs. Ambient Temperature



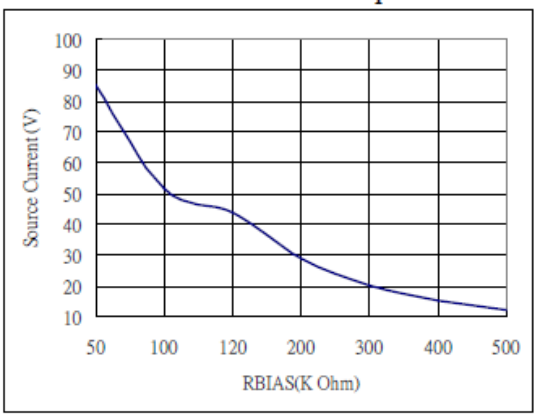
Operating Current vs. Ambient Temperature



VBIAS vs. Ambient Temperature



IFB vs. Ambient Temperature



Source Current vs. RBIAS

SYNC Power Corporation
7F-2, No.3-1, Park Street
NanKang District (NKSP), Taipei, Taiwan, 115, R.O.C
Phone: 886-2-2655-8178
Fax: 886-2-2655-8468
http://www.syncpower.com