Constant Frequency Current Mode PWM Controller with High-Voltage Startup Current Source

FEATURES

- Soft-Burst Mode Technique for Audible Noise Control and Power Loss Reduction in Standby
- Fault-Burst Mode for Power Saving in Fault Operation
- Built-in 500V Startup Current Source
- With Internal Ramp Current Source to Enhance Feedback Control Design Flexibility
- Power and Self Un-lock Mode to Facilitate Easy Implementation of System Protection
- Adjustable Burst Level for Entering Soft-Burst Mode
- Random Frequency Modulation for EMI Reduction
- Pb-Free Device

DESCRIPTION

FT810x (x for A, B) is a highly integrated constant-frequency current mode PWM controller designed for off-line fly-back Switching Mode Power Supply (SMPS). It provides special features to enhance the performance of SMPS that include 500V startup circuit, Soft-Burst Mode (SBM), Fault-Burst Mode (FBM), Timer-based Over Load Protection, Power Un-lock and Self Un-lock Mode. 500V startup current source eliminates the need for an external startup biasing circuit, minimizes the standby power consumption, and saves PCB space. In a light load/fault condition, FT810x operates in the SBM/FBM respectively, which is designed for the reduction of switching power loss. Thanks to these operation modes, under 100mW standby/fault power consumption can be achieved. In addition, SBM/FBM featured with pulse width ramp up sequence offers superior audible noise control. Power/Self Un-lock Mode and Timer-base Over Load Protection make FT810x an excellent candidate for converter where ruggedness and component cost are the key constraints.

TYPICAL APPLICATIONS

- Off-line Battery Chargers
- AC-DC Adapters for Notebook, LCD Monitors
- Consumer Electronic Applications STB, DVD, DVDR

TYPICAL APPLICATION CIRCUIT

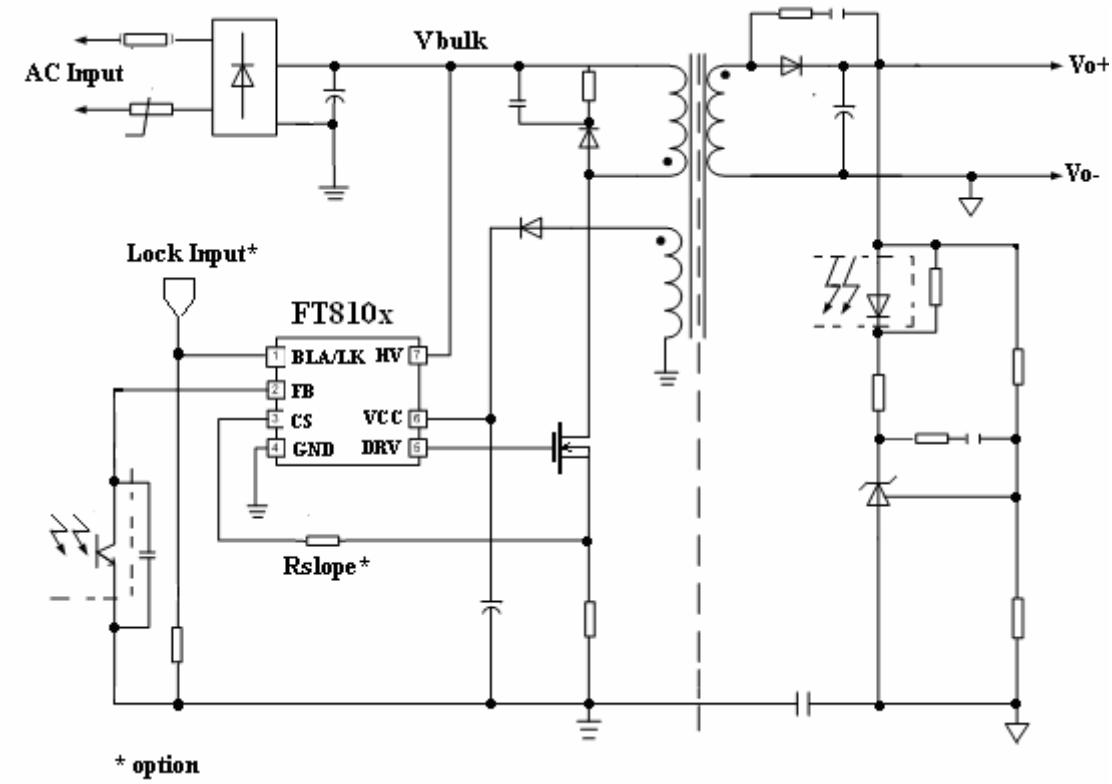


Figure 1 Typical Application Circuit

ABSOLUTE MAXIMUM RATINGS

VCC to GND……-0.3V to +40V
BLA/LK to GND……..……-0.3V to +20V
FB to GND…….... -0.3V to +9V
CS to GND…….…….....-0.3V to +9V
DRV to GND…….....-0.3V to 40V
HV to GND……..……-0.3V to 500V
Operating Temperature Range……...-40℃ to +125℃
Junction Temperature…….... -40℃ to +150℃
Storage Temperature Range ……..…-60℃ to +150℃
ESD Protection HBM…….2000V
MM……...500V

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

PIN COMFIGURATION

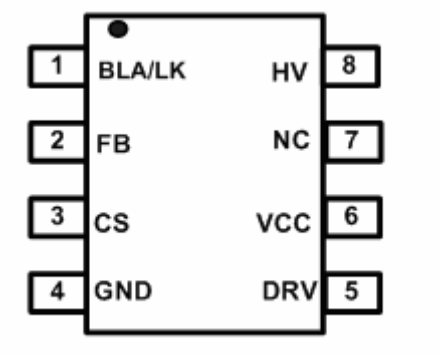


Figure 2 Pin Assignments

TERMINAL DEFINITION

Table 1

PIN	NAME	FUNCTION	DESCRIPTION
1	**BLA/LK**	Burst Level Adjust/ Lock	This pin serves two purposes. First is to set the level of entering Soft-Burst Mode. Another is to provide ease of implementation for different kinds of Power Un-lock or Self Un-lock system protection. The usage of BLA/LK is summarized in Table3.
2	**FB**	Feedback	An opto-coupler collector pulls this pin low during regulation. If this voltage is less than the BLA/LK voltage, then the driver is pulled low and Soft-Burst Mode is activated. If this pin is left open (>3V) for more than 130 ms, then the controller is placed in a Fault-Burst Mode (FBM).
3	**CS**	Current Sense	This pin senses the primary current for PWM regulation. The maximum primary current is limited to 1.0V/Rcs where Rcs is the current sense resistor. Additionally, a resistor Rslope between the current sense node and this pin sets the compensation slope for improved stability.
4	**GND**	IC Ground	Ground.
5	**DRV**	Driver Output	Gate driver output to drive the external MOSEFET.
6	**VCC**	Supply Voltage	Supply voltage pin.
7	**NC**	NC	Unconnected Pin.
8	**HV**	High Voltage	This pin provides (1) Lossless startup sequence (2) Fault-Burst Mode (3) Memory for Power Reset Un-lock Mode.

ORDERING INFORMATION

FT810①②

DESIGNATOR	SYMBOL	SWITCHING FREQUENCY
①	A	65KHz
	B	100KHz
②	**SYMBOL**	**PACKAGE TYPE**
	a	SOP8
	b	DIP8

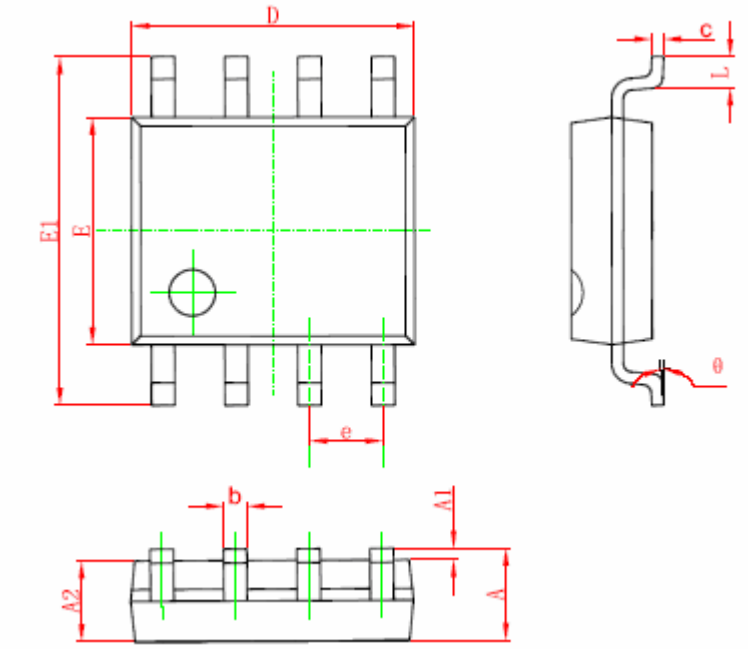
MARKING RULE

① represents frequency option (A:65KHz; B:100KHz)

②③④ for internal reference

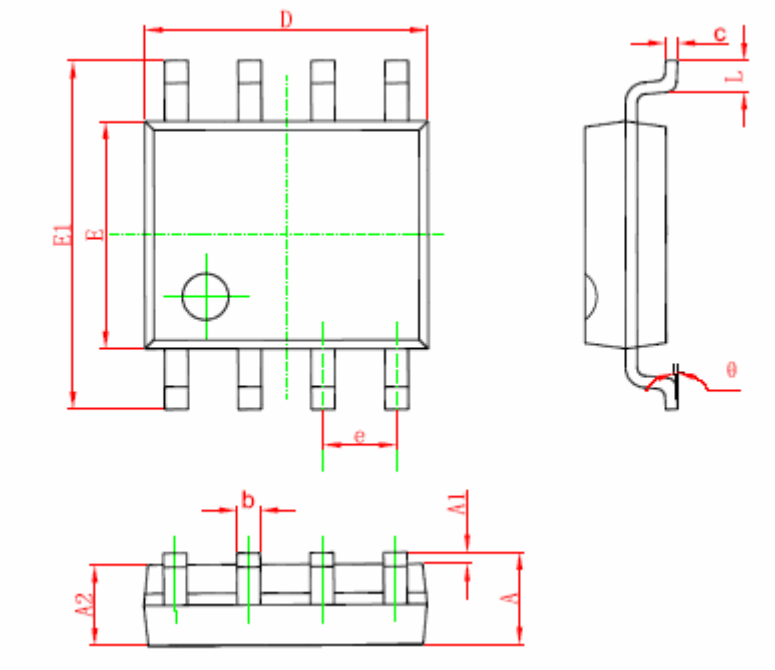
PACKAGE INFORMATION

SOP-8 Package



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Mix	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050（BSC）	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

DIP-8 Package



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524（BSC）		0.060（BSC）	
C	0.204	0.360	0.008	0.014
D	9.000	9.400	0.354	0.370
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540(BSC)		0.100（BSC）	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354