

92% Efficient Synchronous Boost Converter

With 800mA Switch

FEATURES

- Up to 92% efficiency
- Generates 3.3V at 100mA from a single AA cell
- Low Startup Voltage: 0.95V
- Operating Input Voltage down to 0.8V
- Adjustable Output Voltage from 2V to 5.5V
- Internal Synchronous Rectifier
- Fixed 1.2MHz Switching frequency
- Maximum Peak Current: 800mA
- Anti-Ringing Switch Reduces EMI
- Load Disconnect from input During Shutdown
- Over-temperature Protection
- SOT23-6 Package

APPLICATIONS

- All One-Cell, Two-Cell, and Three-Cell Alkaline, NiCd or NiMH or Single-Cell Li-Battery-Powered Products
- Portable Audio Players
- Digital Cameras
- Wireless Handsets
- PDAs
- Cellular Phones
- Personal Medical Products
- White LED Lighting

DESCRIPTION

The FT433x device is a synchronous step-up DC/DC converters delivering high efficiency. Capable of supplying 3.3 at 100mA from a single AA cell input, the devices contain an internal NMOS switch and PMOS synchronous rectifier.

The FT433x is based on a fixed 1.2MHz switching frequency, slope compensated, current mode PWM control with internal compensation. The maximum peak current in the boost switch is typically limited to a value of 800mA. The converter implements an Anti-ringing switch, reducing EMI in discontinuous mode. During shutdown, the load is completely disconnected from input and shutdown current is less than 1uA.

The FT433x output voltage is programmed by an external resistor divider. The device is packaged in a 6-pin thin SOT23 package.

TYPICAL APPLICATION CIRCUIT

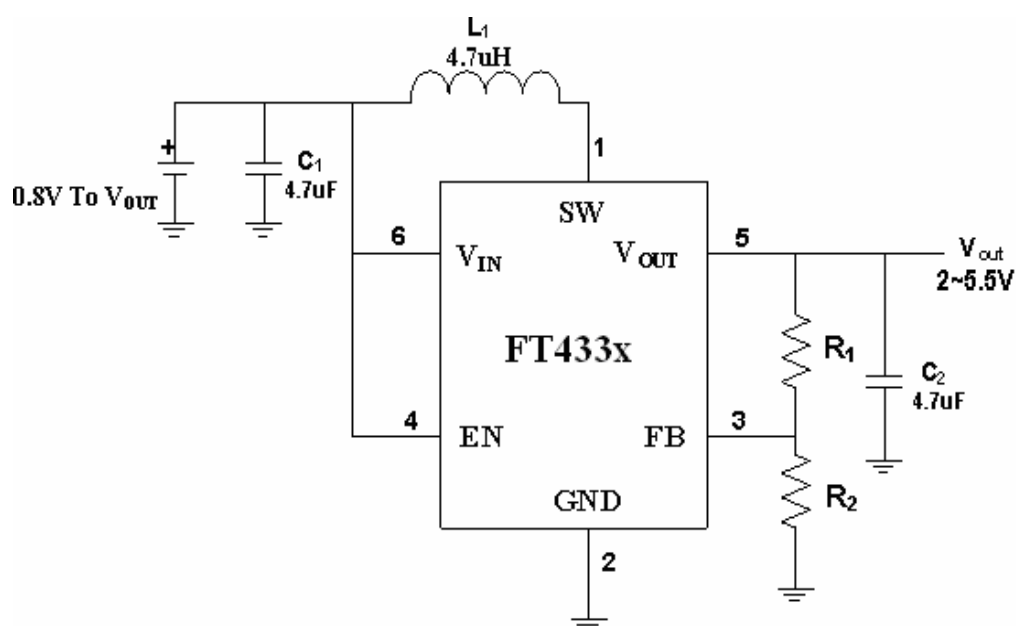
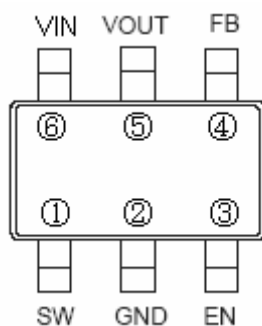


Figure 1: Typical Application Circuit

ABSOLUTE MAXIMUM RATINGS

Input voltage range on SW,VOUT,VIN,EN,FB.....	-0.3V to +7V
Operating virtual junction temperature range, T _J	-40°C to 150°C
Storage temperature.....	-65°C to 150°C

Stresses exceed those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. Functional operation of the device at conditions beyond those listed in the specification is not guaranteed. Prolonged exposure to extreme conditions may affect device reliability or functionality.

PIN CONFIGURATION

Figure 2: Package Top View
THERMINAL FUNCTION

Name	No.	I/O	Description
EN	④	I	Enable input (1/VIN enabled, 0/GND disabled)
FB	③	I	Voltage feedback for programming the output voltage
GND	②		IC ground connection for logic and power
SW	①	I	Boost and rectifying switch input
V _{OUT}	⑤	O	Boost converter output
V _{IN}	⑥	I	Supply voltage

Table 1

BLOCK DIAGRAM

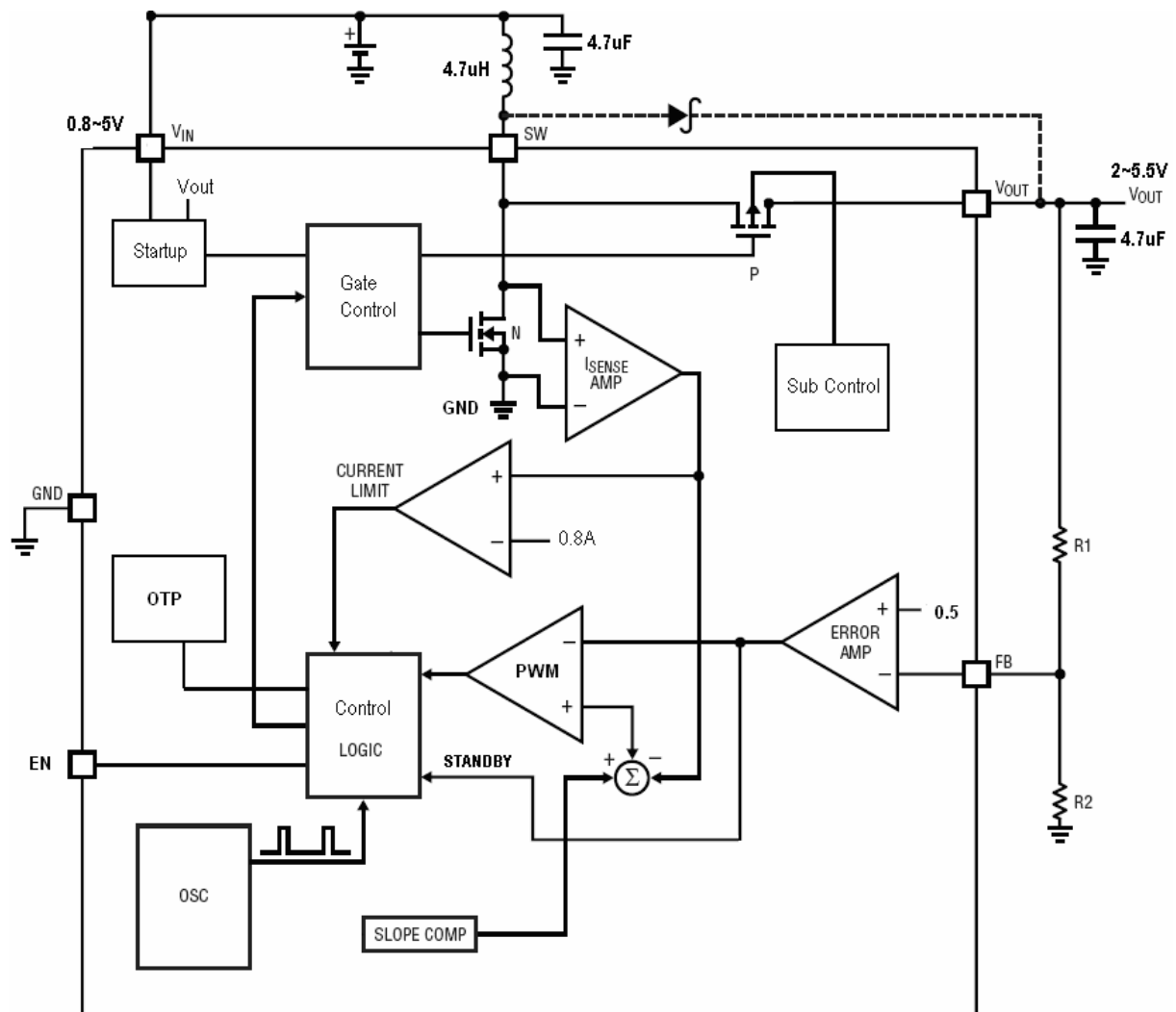
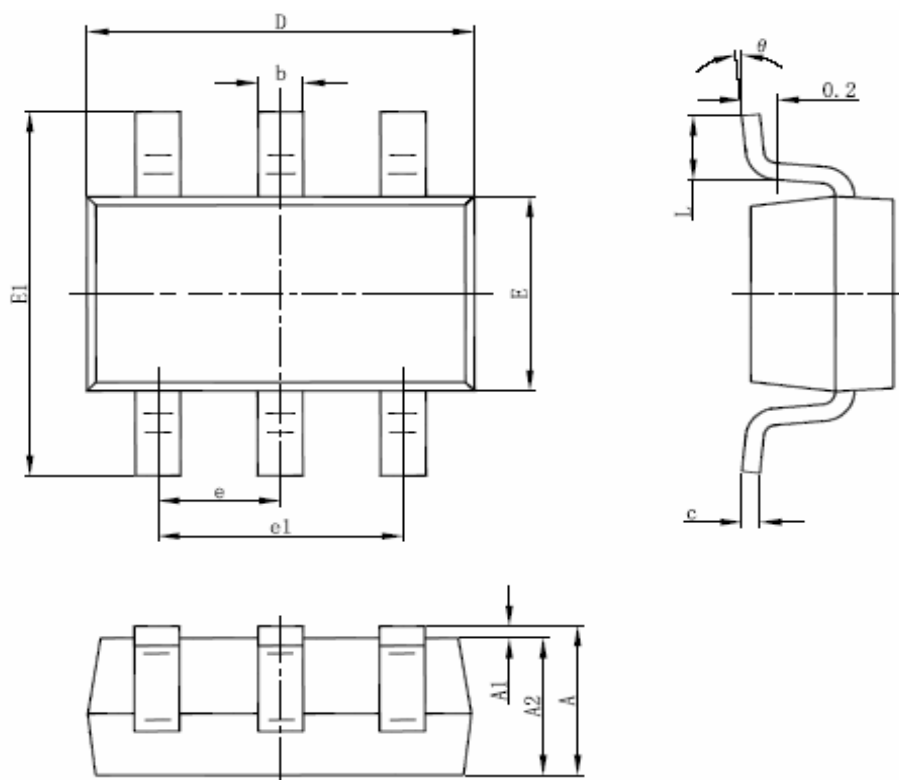


Figure 3: Block Diagram



ELECTRICAL CHARACTERISTICS

DC/DC STAGE						
Parameter		Test Conditions	Min	Typ	Max	Unit
V _{IN}	Minimum input voltage for start-up	I _{load} =1mA		0.95	1.1	V
	Input voltage range, after start-up	T _A = 25 °C	0.8		5	
V _{OUT}	Output voltage range		2		5.5	V
V _{FB}	Feedback voltage		0.49	0.5	0.51	mV
f	Oscillator frequency		1	1.2	1.4	MHz
D	Maximum duty cycle		80	87		%
I _{SW}	Switch current limit	V _{OUT} = 3.3 V	0.6	0.8	1	A
	Start-up current limit			0.5I _{SW}		mA
	Boost switch on resistance	V _{OUT} = 3.3 V		420		mΩ
	Rectifying switch on resistance	V _{OUT} = 3.3V		540		mΩ
	Total accuracy				3%	
	Operating current	I _O = 0mA, V _{EN} = V _{IN} = 1.2V, V _{OUT} = 3.3 V		300	500	μA
	Switch leakage current	SW=5.5V/0V		0.1	1	μA
	VFB leakage current	VFB=1V		1	10	nA
	Shutdown current	V _{EN} = 0 V, V _{IN} = 1.2 V			1	μA
CONTROL STAGE						
V _{UVLO}	Under voltage lockout threshold	V _{IN} voltage decreasing		0.8		V
V _{IL}	EN input low voltage				0.4	V
V _{IH}	EN input high voltage		1.3			V
	EN input current	Clamped on GND or V _{IN}		0.01	0.1	μA
	Over-temperature protection			140		°C
	Over-temperature hysteresis			20		°C

PACKAGING INFORMATION
SOT-23 -6


Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037 (BSC)	
e1	1.800	2.000		0.079
L	0.300	0.600		0.024
θ	0°	8°	0°	8°