GENERAL DESCRIPTION

The ACP2826 is a high-efficiency, DC/DC step-down switching regulators, capable of delivering up to 2A of output current. The device operates from an input voltage range of 2.4V to 6.0V and provides an output voltage from 0.6V to VIN, making the ACP2826 ideal for low voltage power conversions. Running at a fixed frequency of 1MHz allows the use of small external components, such as ceramic input and output caps, as well as small inductors, while still providing low output ripples. This low noise output along with its excellent efficiency achieved by the internal synchronous rectifier, making ACP2826 an ideal green replacement for large power consuming linear regulators. Internal soft-start control circuitry reduces inrush current. Short-circuit and thermal-overload protection, input over voltage and input under voltage lockout protection improves design reliability.

The device is available in an SOT25 package.

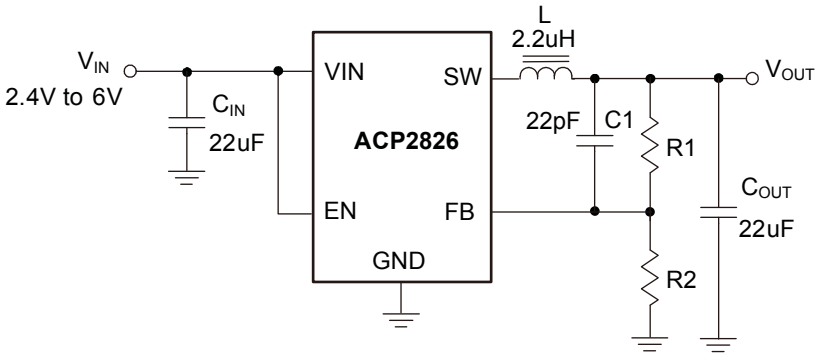
FEATURES

- Operating Voltage Range: 2.4V ~ 6V
- Adjustable Output with 0.6V Reference Voltage
- Guaranteed 2A Output Current
- Automatic PFM Mode at Light Load
- Low dropout 100% Duty Operation
- High 1MHz Operating Frequency
- Maximum 1μA Shutdown Current
- Internal Soft Start Function
- Excellent Line and Load Transient Response
- Short Circuit Protection
- Input Over Voltage Protection
- Under Voltage Lockout Protection
- Thermal Shutdown Protection

APPLICATION

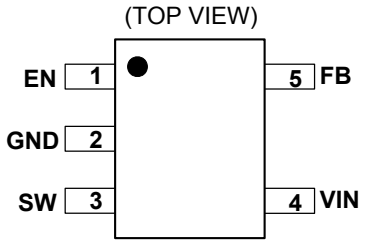
- Cellular Phones
- DSP Core Supplies
- Wireless LAN
- Portable Instruments

APPLICATION CIRCUIT



Typical ACP2826 Application Circuit

PIN CONFIGURATION

Pin Configuration	Pin Description		
SOT25	**Pin#**	**Symbol**	**Function**
	1	EN	Enable Pin
	2	GND	Ground
	3	SW	Power Switching
	4	VIN	Input Supply Pin
	5	FB	Feedback Pin

ORDERING INFORMATION

Standard Part NO.	Package	Packing	Min. Quantity
ACP2826-BAA	SOT25	Tape & Reel	3000PCS

ABSOLUTE MAXIMUM RATINGS(T_A = +25°C)

Parameter	Symbol	Rating	Unit
Input, SW, EN, FB Voltage		-0.3 to 7	V
EN Voltage	V_{EN}	-0.3 to V_{IN}	
Maximum Power Dissipation	P_D	600	mW
Operating Junction Temperature	T_J	-40 to150	°C
Storage Temperature	T_S	-65 to 150	
Lead Temperature	T_L	260	
Human Body Mode	HBM	2000	V

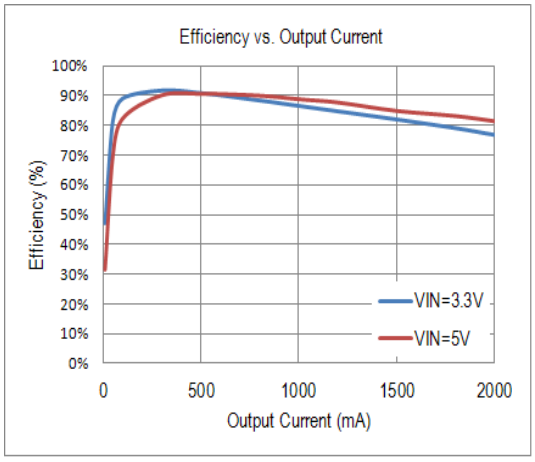
RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Rating	Unit
Input Voltage Range	V_{IN}	2.4 to 6	V
Operating Ambient Temperature	T_A	-40 to 85	°C

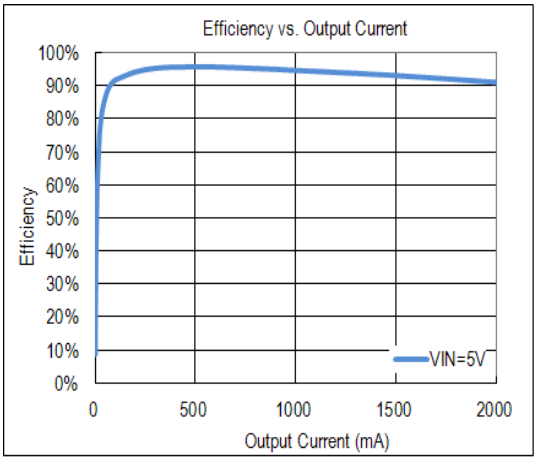
ELECTRICAL CHARACTERISTICS(T_A = +25°C)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Feedback Voltage	V_{FB}	V_{IN}=5V	0.588	0.6	0.612	V
Switching Frequency	F_S			1		MHz
Feedback Leakage Current	I_{FB}			0.1	1	μA
Quiescent Current	I_Q	V_{FB} =0.65V, No Switching		40	75	
Shutdown Supply Current	I_{SHUT}	V_{EN}=0V		0.1	1	
Line Regulation		V_{IN}=2.5V to 6V		0.1	0.5	%/V
Load Regulation		I_{OUT}=0.01 to 1A		-0.5	-1	%/A
PMOS RDS(ON)	$R_{PDS(ON)}$			155		mΩ
NMOS RDS(ON)	$R_{NDS(ON)}$			72		
Peak Current Limit	I_{LIMIT}		2.3	2.5		A
SW Leakage Current	$I_{L(SW)}$	V_{OUT}=V_{SW}=5V, V_{EN}=0V			1	μA
EN Leakage Current	$I_{L(EN)}$				1	
Over Voltage Protection Threshold	V_{OVP}		6	6.3	6.5	V
Under Voltage Lockout Threshold	V_{UVLO}		1.7	1.9	2.1	
EN Input High Voltage	$V_{H(EN)}$		1			
EN Input Low Voltage	$V_{L(EN)}$				0.3	
Thermal Shutdown Temp	T_{SD}			160		°C

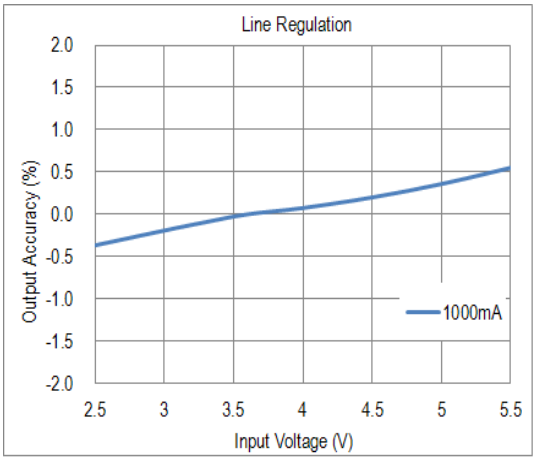
PERFORMANCE CHARACTERISTIC



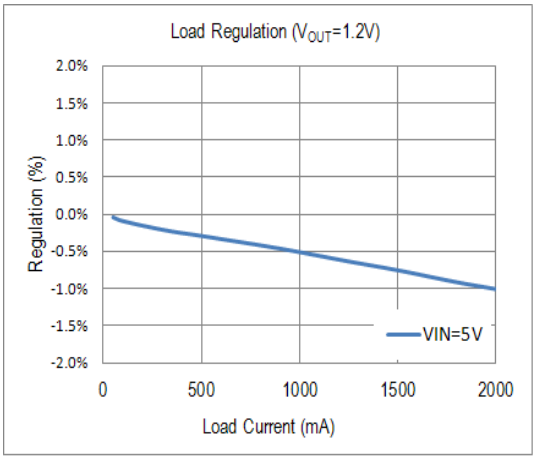
V_{OUT} = 1.2V



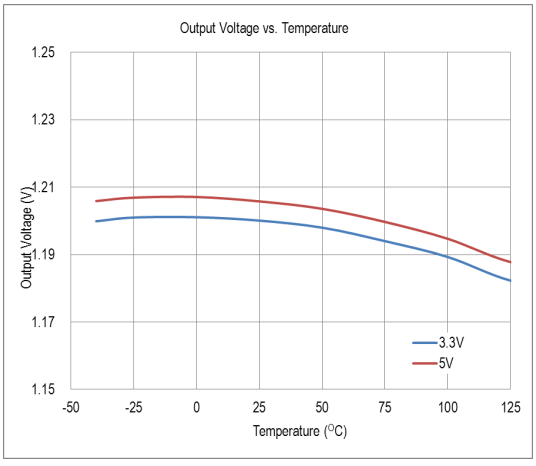
V_{OUT} = 3.3V



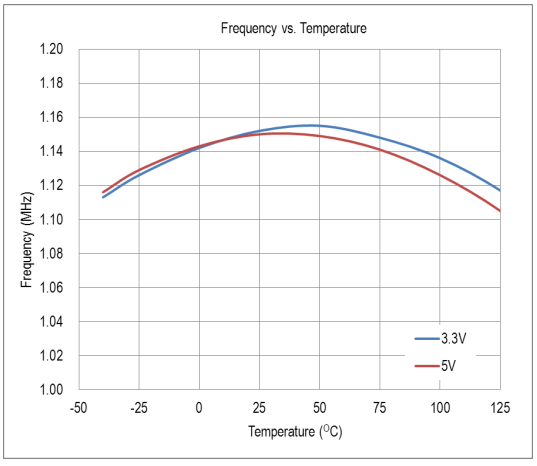
I_{OUT}=500mA



I_{OUT}=500mA

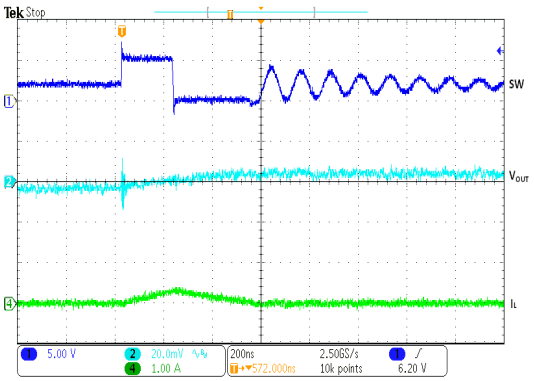


I_{OUT}=500mA

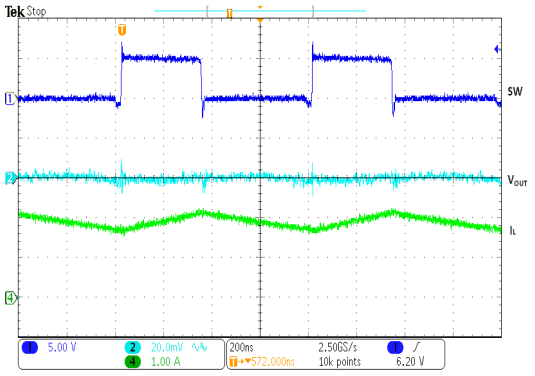


I_{OUT}=500mA

PERFORMANCE CHARACTERISTIC (Continued)

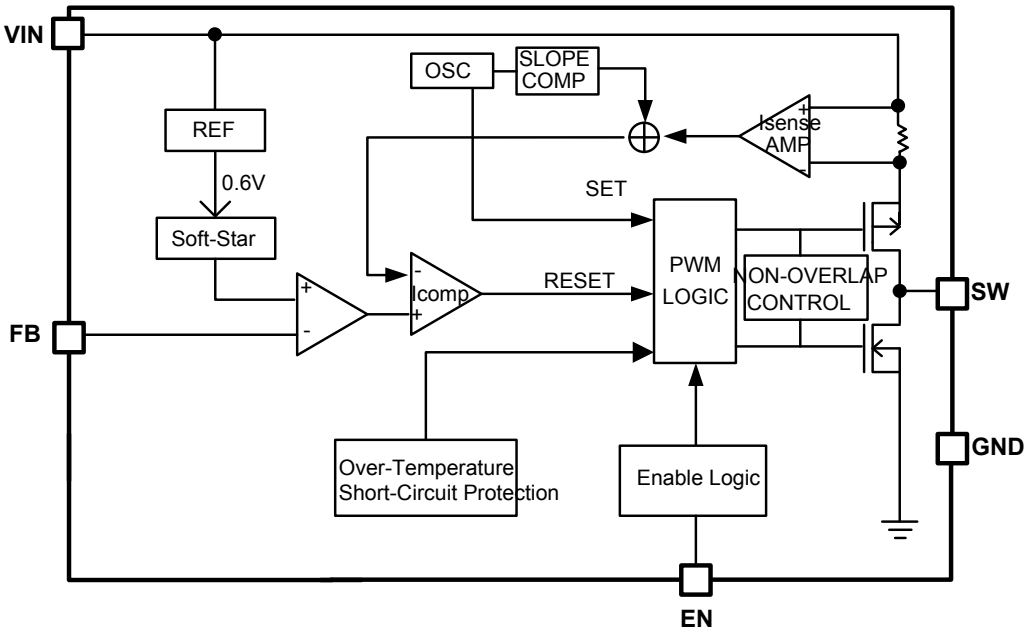


No Load Switching Waveform, $5V_{IN}$ to $1.8V_{OUT}$



2A Load Switching Waveform, $5V_{IN}$ to $1.8V_{OUT}$

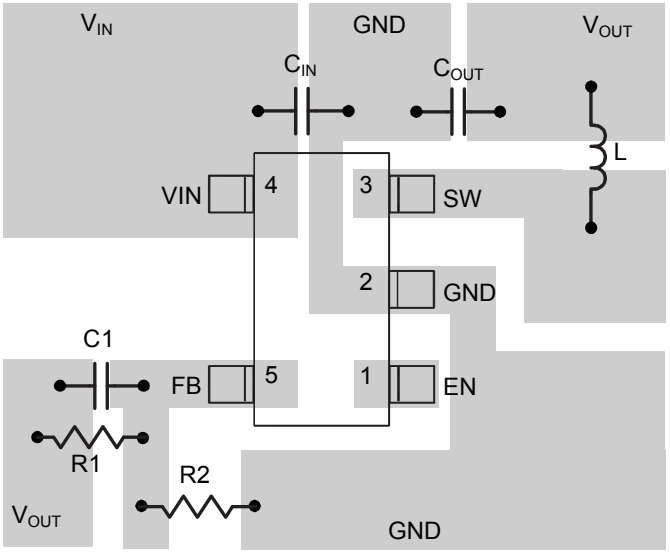
FUNCTION BLOCK



Functional Block Diagram

Layout Consideration

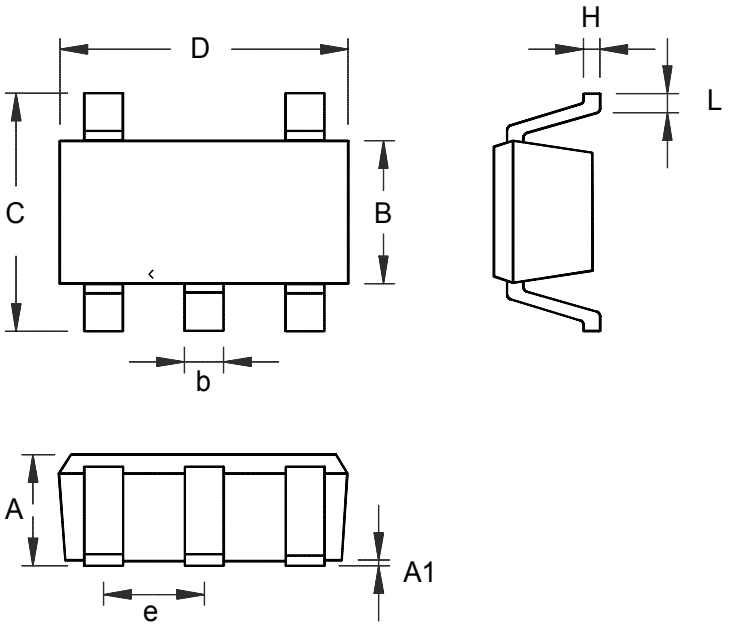
As with all switching regulators, careful attention must be paid to the PCB board layout and component placement. To maximize efficiency, switch rise and fall times are made as short as possible. To prevent electromagnetic interference (EMI) problems, proper layout of the high frequency switching path is essential. The voltage signal of the SW pin has sharp rise and fall edges. Minimize the length and area of all traces connected to the SW pin and always use a ground plane under the switching regulator to minimize inter-plane coupling. In addition, the ground connection for the feedback resistor R2 should be tied directly to the GND pin and not shared with any other component, ensuring a clean, noise-free connection. Please refer to next figure:



PCB Layout

PACKAGE INFORMATION

- **SOT25**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.889	1.295	0.0.35	0.051
A1	0.000	0.152	0.000	0.006
B	1.397	1.803	0.055	0.071
b	0.356	0.559	0.014	0.022
C	2.591	2.997	0.102	0.118
D	2.692	3.099	0.106	0.122
e	0.838	1.041	0.033	0.041
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024