

GENERAL DESCRIPTION

The ACP2812 is a 2A, PWM synchronous buck DC-DC converter with a 340kHz fixed frequency wide input voltage range of 4.5V to 18V, capable of driving a 2A load with high efficiency. The device integrates N-channel power MOSFET switches with low on resistance. Current mode control provides fast transient response and cycle-by-cycle current limit.

The device is available in the SOP8-EP packages.

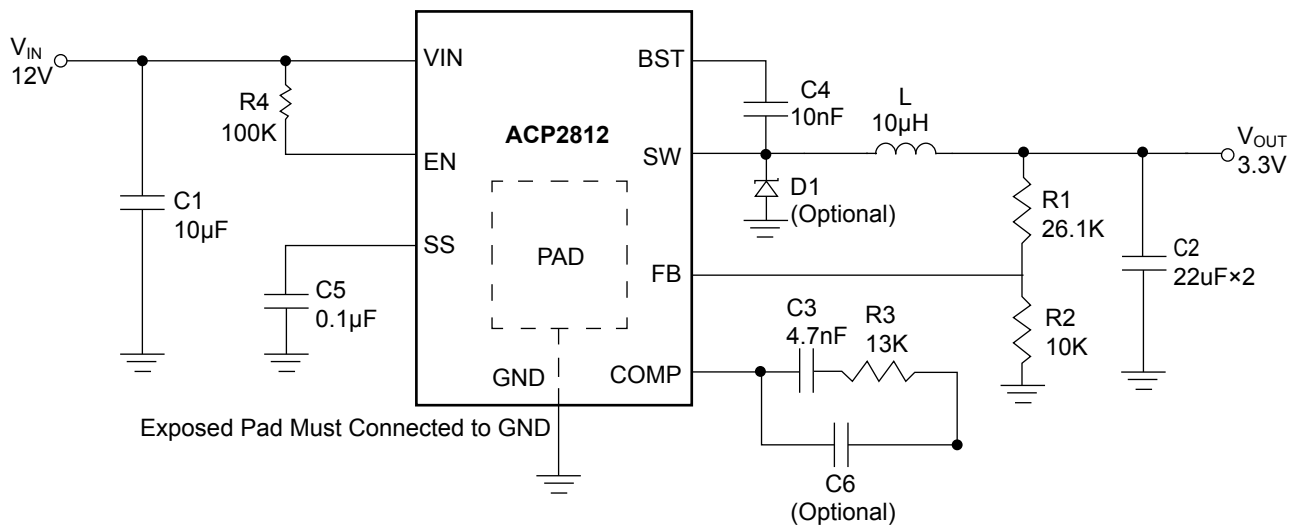
FEATURES

- V_{OUT} Range: 4.5V to 18V
- Output Current: 2A
- Fixed 340kHz Frequency
- Up to 95% Efficiency
- Current Mode Control
- Over Current Protection
- Thermal Shutdown Function
- Built-In UVLO Function
- Over Voltage Protection
- Programmable Soft-start

APPLICATION

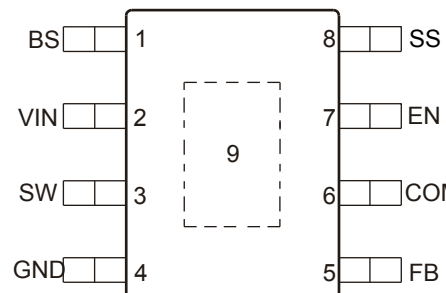
- Set Top Box
- Portable DVD
- Portable DVD
- Digital Photo Frame

APPLICATION CIRCUIT



Typical ACP2812 Application Circuit

▼ PIN CONFIGURATION

Pin Configuration	Pin Description		
SOP8-EP	Pin#	Symbol	Function
<p>(TOP VIEW)</p> 	1	BS	Bootstrap Pin
	2	VIN	Power Input Pin
	3	SW	Power Switching Output
	4	GND	Ground
	5	FB	Feedback Pin
	6	COMP	Compensation
	7	EN	Enable Input
	8	SS	Soft-Start Control Input Pin
	9	EXPOSED PAD	Exposed Pad Must Connected to GND

▼ ORDERING INFORMATION

Standard Part NO.	Package	Packing	Min. Quantity
ACP2812-THAA	SOP8-EP	Tape & Reel	3000PCS

▼ ABSOLUTE MAXIMUM RATINGS($T_A = +25^\circ\text{C}$)

Parameter	Symbol	Rating	Unit
Supply Input Voltage	V_{IN}	-0.3 to 20	V
Bootstrap Pin Voltage	V_{BS}	-0.3 to $V_{SW} + 6.0$	V
Enable/UVLO Pin Voltage	V_{EN}	-0.3 to V_{IN}	V
Soft-Start Pin Voltage	V_{SS}	-0.3 to 6	V
Feedback Pin Voltage	V_{FB}	-0.3 to 6	V
Compensation Pin Voltage	V_{COMP}	0.3 to 6	V
Switch Pin Voltage	V_{SW}	21	V
Lead Temperature	T_L	260	$^\circ\text{C}$
Storage Temperature	T_S	-65 to 150	$^\circ\text{C}$
Operating Junction Temperature	T_J	150	$^\circ\text{C}$
Human Body Model	HBM	2000	V
Charged Device Model	CDM	200	V
Junction to Ambient	θ_{JA}	105	$^\circ\text{C/W}$

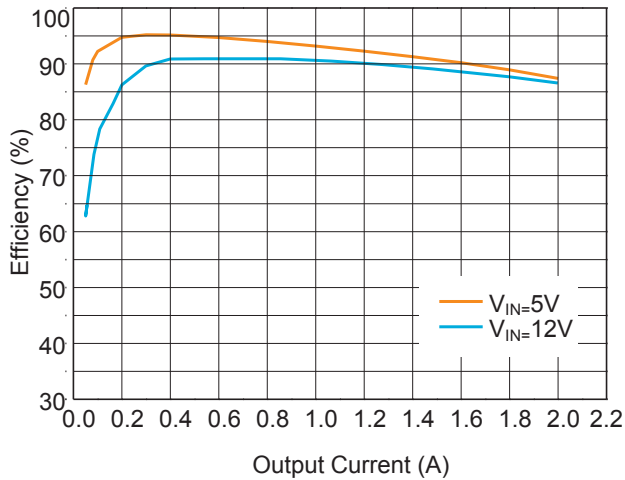
RECOMMENDED WORK CONDITIONS

Parameter	Symbol	Rating	Unit
Input Voltage Range	V_{IN}	4.5 to 18	V
Ambient Temperature	T_A	-40 to 85	°C

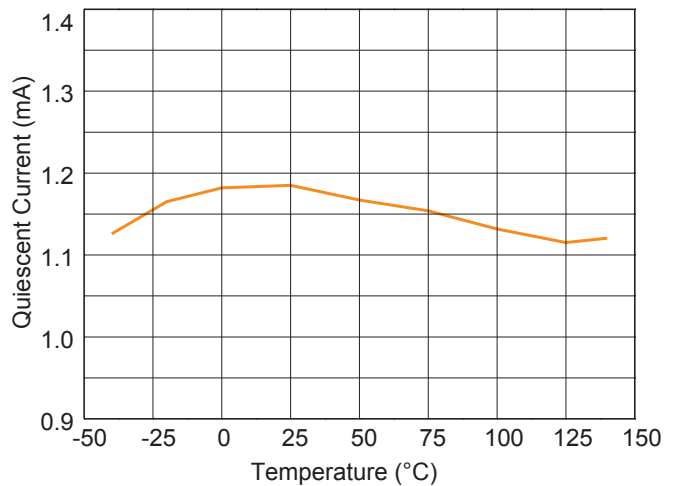
ELECTRICAL CHARACTERISTICS($T_A = +25^{\circ}\text{C}$)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input Voltage	V_{IN}		4.5		18	V
Shutdown Supply Current	I_{SHDN}	$V_{EN} = 0V$		0.1	10	μA
Quiescent Current	I_Q	$V_{EN} = 3V, V_{FB} = 1V$		1.2	1.4	mA
VIN Undervoltage Rising Threshold	ULVO	V_{IN} Rising	3.65	4	4.25	V
VIN Undervoltage Hysteresis				200		mV
High-Side Switch On-Resistance	$R_{DS(ON)_H}$	$I_{SW} = 0.2A/0.7A$		100		m Ω
Low-Side Switch On-Resistance	$R_{DS(ON)_L}$	$I_{SW} = -0.2A/-0.7A$		100		m Ω
EN Shutdown Threshold Voltage			1.1	1.5	2	V
EN Shutdown Threshold Voltage Hysteresis				350		mV
EN Lockout Threshold Voltage			2.2	2.5	2.7	V
High-side Switch Leakage Current	I_{LEAKH}	$V_{IN}=18V, V_{EN}=V_{SW}=0V$		0.1	10	μA
High-side Switch Current Limit	I_{LIMH}		2.7	3.5		A
Low-side Switch Current Limit	I_{LIML}	From Drain to Source		1.4		A
Oscillator Frequency	f_{SW}		280	340	400	kHz
Feedback Voltage	V_{FB}		907	925	943	mV
Feedback Bias Current	I_{FB}	$V_{FB}=1V$	-0.1		0.1	μA
Max. Duty Cycle	D_{MAX}	$V_{FB}=0.85V$		90		%
Min. Duty Cycle	D_{MIN}	$V_{FB}=1V$			0	%
Thermal Shutdown	T_{OTSD}			160		°C
Thermal Shutdown Hysteresis	T_{Hys}			30		°C
Soft-start Time	t_{SS}	$C_{SS}=0.1\mu\text{F}$		15		mS

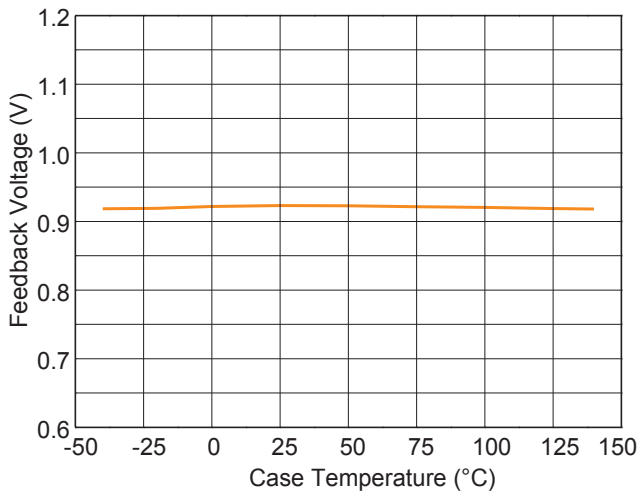
PERFORMANCE CHARACTERISTIC



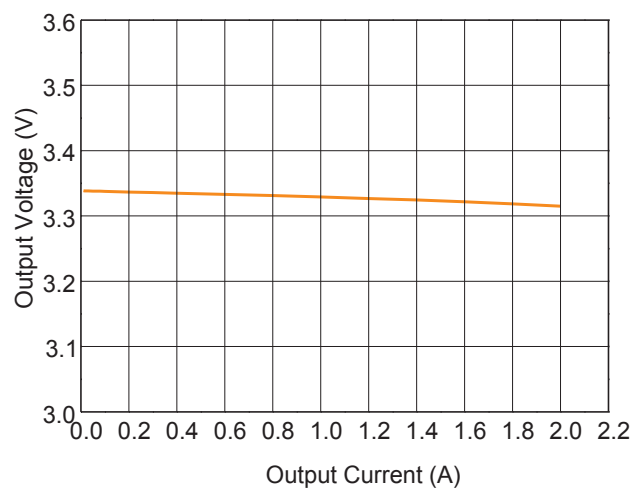
Efficiency vs. Output Current



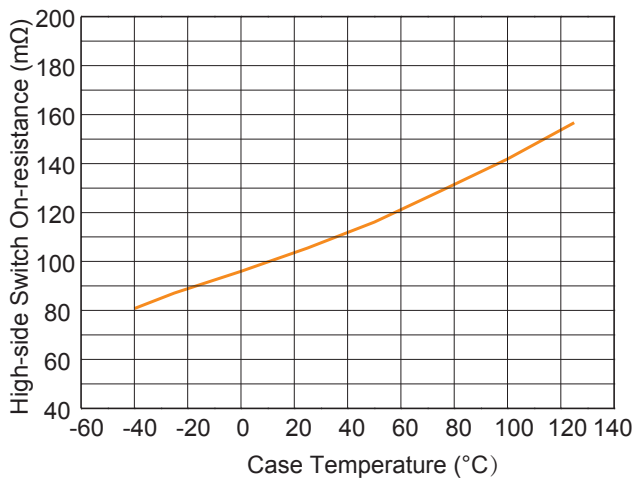
Quiescent Current vs. Case Temperature



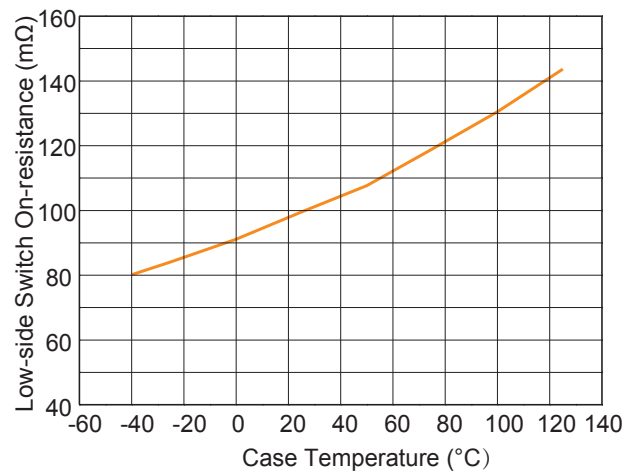
Feedback Voltage vs. Case Temperature



Output Voltage vs. Output Current

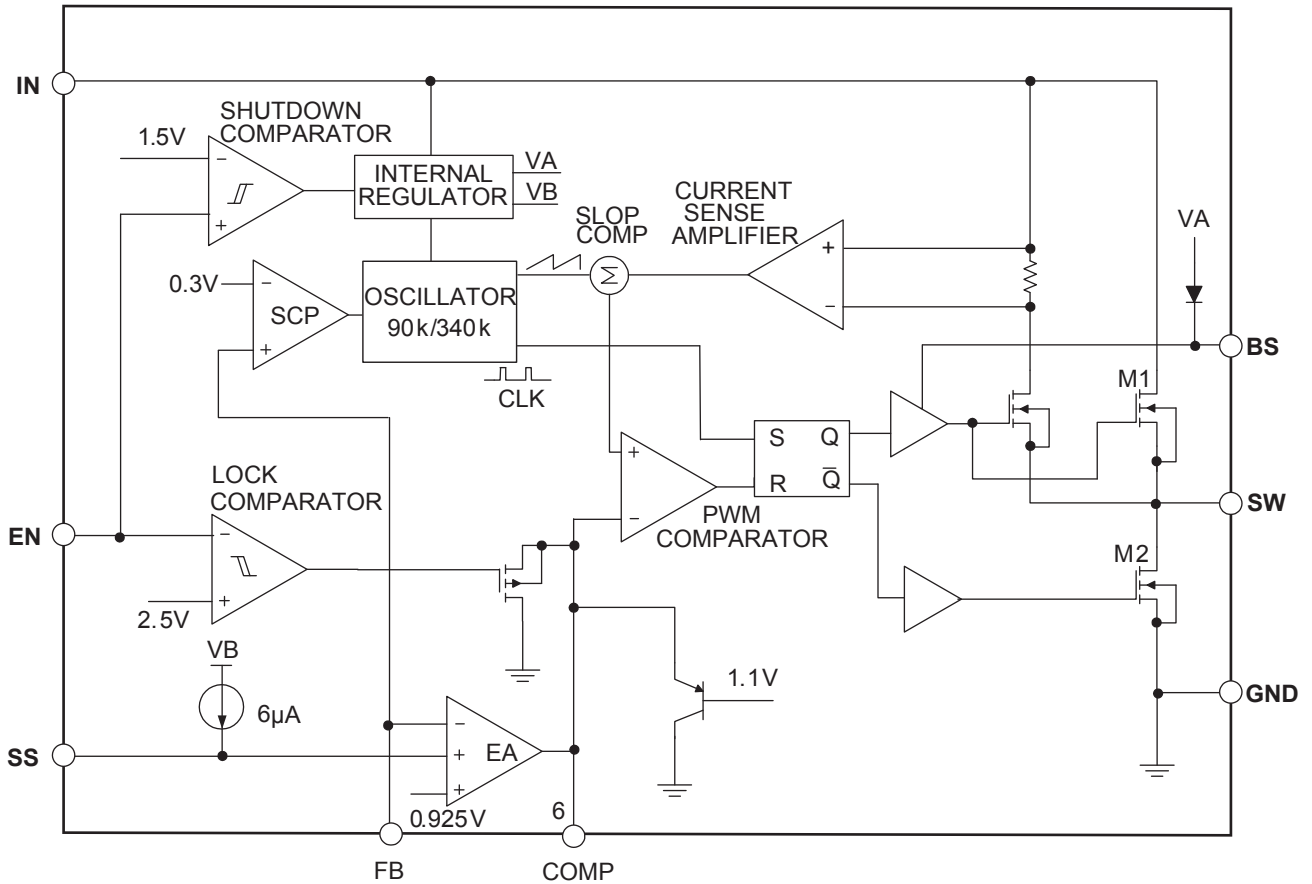


High-side Switch On-resistance vs. Case Temperature



Low-side Switch On-resistance vs. Case Temperature

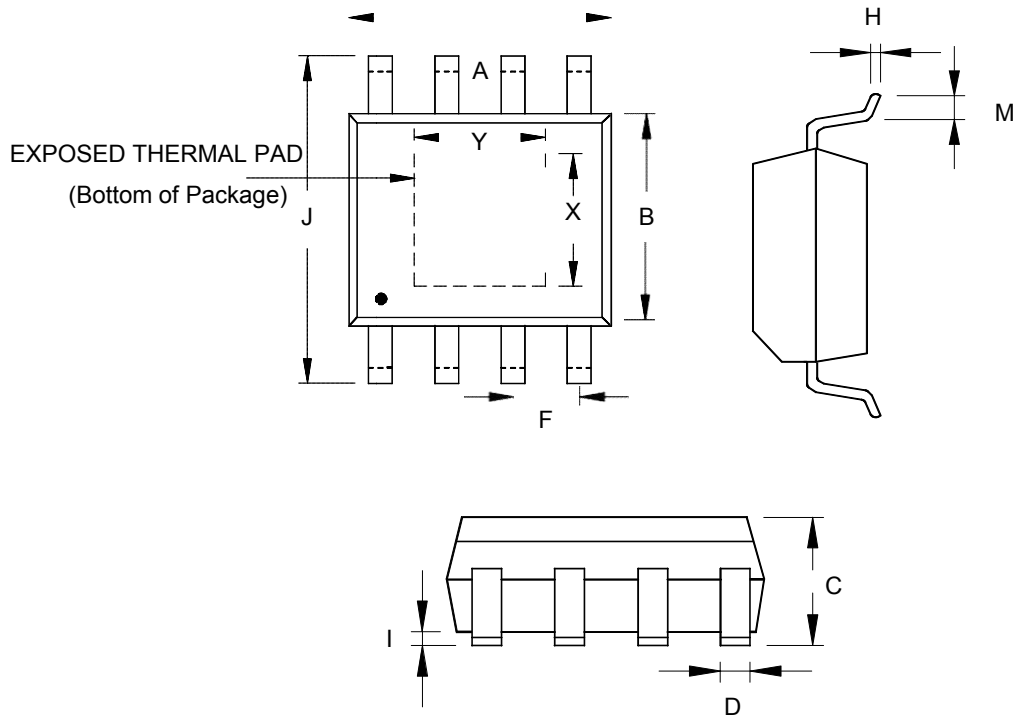
FUNCTION BLOCK



Functional Block Diagram

PACKAGE INFORMATION

- SOT8-EP



Symbol	Dimensions In Millimeters		Dimensions In Inches		
	Min	Max	Min	Max	
A	4.801	5.004	0.189	0.197	
B	3.810	4.000	0.150	0.157	
C	1.346	1.753	0.530	0.069	
D	0.330	0.510	0.013	0.020	
F	1.197	1.346	0.047	0.053	
H	0.170	0.254	0.007	0.010	
I	0.000	0.152	0.000	0.006	
J	5.791	6.200	0.228	0.244	
M	0.406	1.270	0.016	0.050	
Option 1	X	2.000	2.300	0.079	0.091
	Y	2.000	2.300	0.079	0.091
Option 2	X	2.100	2.500	0.083	0.098
	Y	3.000	3.500	0.118	0.138